Leica iCON site
How to Guide

Version 2.0
English

- when it has to be **right**

Leica Geosystems

Introduction

Purchase

Congratulations on the purchase of a Leica iCON site software.

Symbols

The symbols used in this manual have the following meanings:

Type	Description
☞	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

Trademarks

- Windows is a registered trademark of Microsoft Corporation in the United States and other countries

All other trademarks are the property of their respective owners.

Validity of this manual

This manual applies to the Leica iCON site software.

Available documentation

Name	Description/Format		
Leica iCON site How to Guide	This guide is intended to introduce you to the iCON site software, and explain how it connects and operates with other Leica Construction products. Included are detailed descriptions of special settings and functions.		✓

Refer to the following resources for all Leica iCON site documentation/software:

- the Leica USB documentation card
- https://myworld.leica-geosystems.com

myworld @Leica Geosystems

myWorld@Leica Geosystems (**https://myworld.leica-geosystems.com**) offers a wide range of services, information and training material.
With direct access to myWorld, you are able to access all relevant services whenever it is convenient for you, 24 hours a day, 7 days per week. This increases your efficiency and keeps you and your equipment instantly updated with the latest information from Leica Geosystems.

Service	Description
myProducts	Add all Leica Geosystems products that you and your company own. View detailed information on your products, buy additional options or Customer Care Packages (CCPs), update your products with the latest software and keep up-to-date with the latest documentation.
myService	View the service history of your products in Leica Geosystems Service Centres and detailed information on the services performed on your products. For your products that are currently in Leica Geosystems Service Centres view the current service status and the expected end date of service.
mySupport	Create new support requests for your products that will be answered by your local Leica Geosystems Support Team. View the complete history of your Support and view detailed information on each request in case you want to refer to previous support requests.

Service	Description
myTraining	Enhance your product knowledge with the Leica Geosystems Campus - Information, Knowledge, Training. Study the latest online training material or download training material on your products. Keep up-to-date with the latest News on your products and register for Seminars or Courses in your country.
myTrustedServices	Offers increased productivity while at the same time providing maximum security. • myExchange With myExchange you can exchange any files/objects from your computer to any of your Leica Exchange Contacts. • mySecurity If your instrument is ever stolen, a locking mechanism is available to ensure that the instrument is disabled and can no longer be used.

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1 Operating Principles

This guide is intended to introduce you to the iCON site software, and explain how it connects and operates with other Leica Construction products. It can act as a quick field reference manual, whilst also providing concise information relating to configuration, data transfer, and the functionality contained within different field applications.

Some features are only accessible when using a specific instrument, for example a Total Station. In the "How to" sections of this manual, this will be indicated with special icons: **TPS** for Total Station, **GPS** for a GPS instrument, or **TPS** + **GPS** for both instrument types.

1.1 Equipment

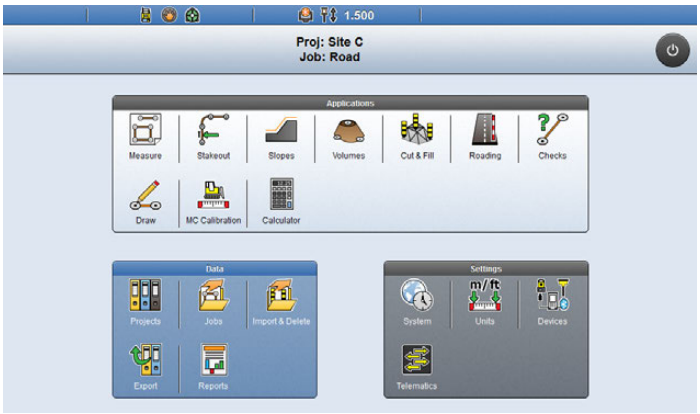
Display formats

iCON site is available in different display formats, depending on the equipment you are using:

3.5″ Portrait:

3.5″ Landscape:

7″ Landscape:

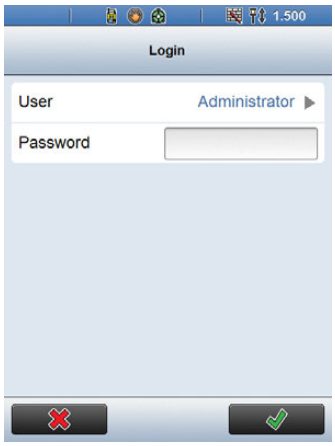


The applications used in each display format have the same functionality.
This manual shows images from the 3.5″ portrait display. Reference will be made to the 3.5" or 7" Landscape display format if there are small differences in appearance or functionality.

Startup & Login

1. **iCON site** software starts automatically after the device is switched on.
2. In case the iCON site software was exited, you can re-enter by selecting **iCON** from the Start menu within Windows.

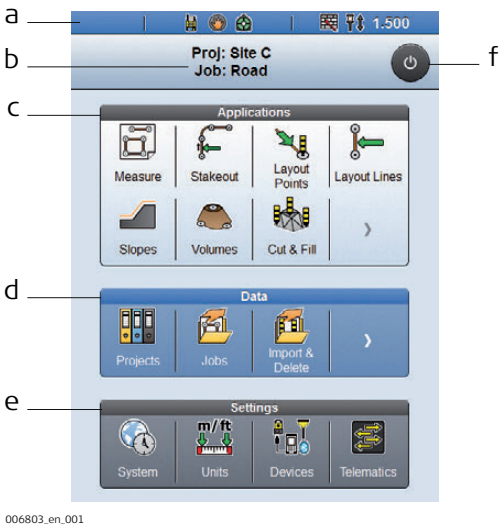
3. If you logged out after the previous session, **Login** screens opens.
   Select appropriate **User** and enter **Password**.
   Tap to confirm.
   If you didn't logout at the end of your last use, then **iCON site Home Menu** opens directly.



Principles of operation

Upon launching iCON site and logging in, **Home Menu** is the first screen to be displayed.

Description of the Home Menu elements:

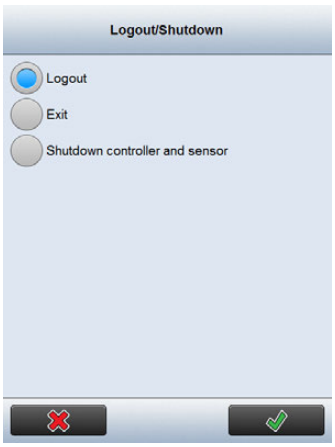


a) Status bar
b) Title bar
c) Applications container
d) Data container
e) Settings container
f) Power key

Element	Description
Status bar	Contains icons that indicate status of the controller, and the connected instrument. In the Home Menu, the Status Bar is minimized and read-only.
Title bar	Present in the Home Menu and dialogues. Displays title of current screen.
Applications container	Displays the different applications available for use.
Data container	Contains options to import and export data, and options to create reports. Select different jobs/projects here.
Settings container	Contains options for editing user information, units and tolerances, and connected device settings. Licenses can be added here.
Power key	Gives access to logout and shutdown functions.

Logout/Shutdown

The **Power key** in the Home Menu navigates to the **Logout/Shutdown** screen, giving the following options:

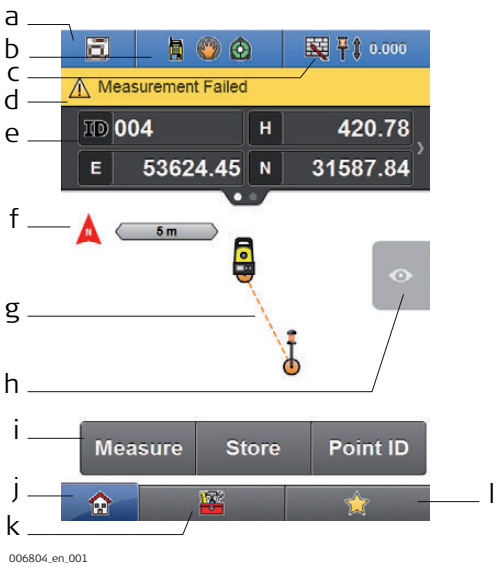


- **Logout**:
  You are logged out and directed to the login screen. From the login screen you can choose to exit the software, or login as another user.
- **Exit**:
  Closes iCON site, without logging you out. When iCON site is next launched, no login details are required, and you are immediately logged in.
- **Shutdown controller and sensor**:
  Automatically shuts down the connected instrument, and exits to Windows.

Applications

Once an application is selected, you are directed to the Map screen, where you will go to work:

Description of the Map screen elements:

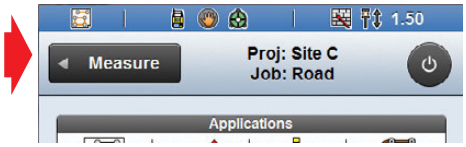


a) Application key
b) Status 1
c) Status 2
d) Warning bar
e) Information bar
f) North indicator and scale bar
g) Main map area
h) Map handler
i) Measure bar
j) Home key
k) Toolbox
l) Favourites

Element	Description
Application key	Displays name of current active project and active job.
Status 1	Displays status of connected Total Station or GPS instrument. Contains options to directly edit function/status of the instrument.
Status 2	• **For TPS**: displays status of target, for example pole and prism information, and controller. • **For GPS**: displays status of the communication devices (radio or modem). Contains options to edit relative settings.
Warning bar	Displays any issues with the operation that may compromise usability.
Information bar	Displays information about the current measurement.
North indicator and scale bar	Indicates scale and orientation of display.
Main map area	Graphically displays pre-loaded data and measured data.
Map handler	Change zoom level and view mode. Define data displayed in the main map area.
Measure bar	Displays main command keys, for example **Measure** or **Store**.
Home key	Navigates back to the Home Menu.
Toolbox	Contains functions relevant to the open application.
Favourites	The content of this menu can be defined according to your requirements. Refer to "Measure bar" for information about configuring Favourites. It also contains a calculator and a link to Setup.

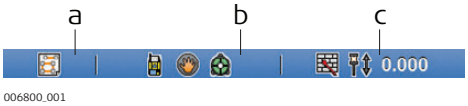
Depending on the specific application being used, slightly different functionality is present. Aspects of the Map screen appear different in different applications.

If you select the **Home** key whilst in an application, the Home Menu is displayed. The Title bar contains a **Back** key with an option of navigating directly back to the **previous application**, for example **Measure**:



Status bar TPS

Status bar displays the status of the controller, the status of the connected instrument, pole and prism information, and information about the current application. It consists of three keys:

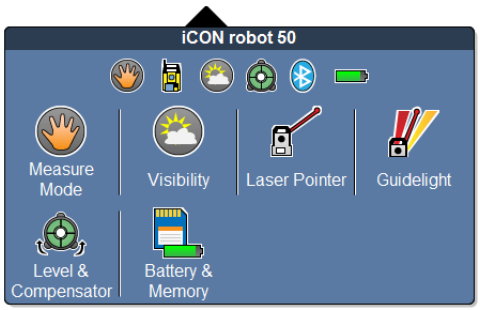


a) Application key
b) Status 1
c) Status 2

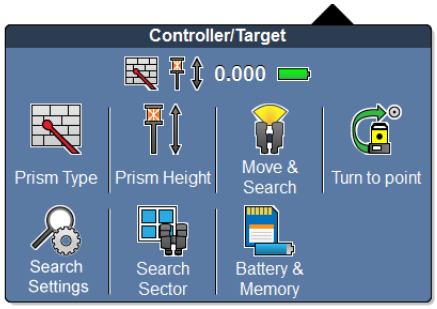
Key	Description
Application key	Displays key information about the current job, project and application. An additional icon displays the current status of **Telematics** as well. Once tapped, the Application key allows to access the **Station information** details by tapping **Station Info** as well as the **Telematics Information** details by tapping the current **Telematics** status icon.
Status 1	Instrument status. Displays battery and memory status. Define Measure Mode. Define instrument settings, for example Laser Pointer, Guide Light.
Status 2	Pole and controller status. Displays battery and memory status. Define prism type and pole height. Prism search controls are also found here.

Status 1 and **Status 2** contain additional information/functionality once tapped, allowing the status of instrument and pole to be changed.

Status 1:



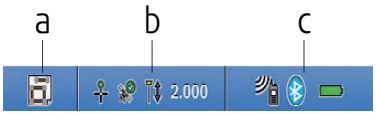
Status 2:



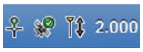
The content of Status 1 and Status 2 will change depending on the functionality of the connected Total Station.

Status bar GPS

Status bar displays the status of the controller, the connected instrument, position quality information, and information about the current application. It consists of three keys:

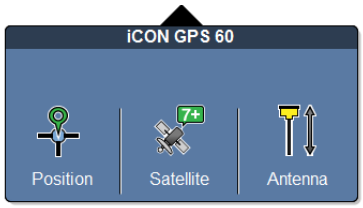


a) Application key
b) Status 1
c) Status 2

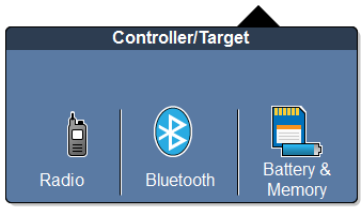
Key	Description
Application key	Displays key information about the current job, project and application. An additional icon displays the current status of **Telematics** as well. Once tapped, the Application key allows to access the **Telematics Information** details by tapping the current **Telematics** status icon.
Status 1 	Instrument/Antenna status. Displays position and satellite information.
Status 2	Communication status. Displays connection status of radio, modem and Bluetooth. Displays battery and memory status.

☞ **Status 1** and **Status 2** contain additional information/functionality once tapped, allowing the status of the antenna to be monitored and changed, and the position quality to be reviewed.

Status 1:

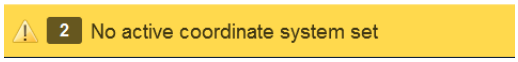


Status 2:



Warning bar

Displays any issues that are affecting operation.



☞ The number on the Warning bar indicates the total number of warnings that are currently active.

The warning bar can be tapped to display the full message, which:

- displays further information about the problem(s),
- provides navigation to areas where the problem can be fixed.

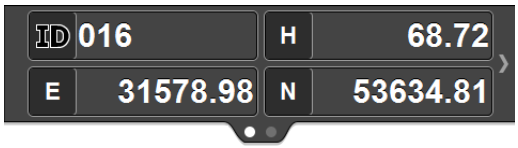
☞ By pressing **OK** without fixing the problem, the warning will be ignored until it is detected again.

Information bar

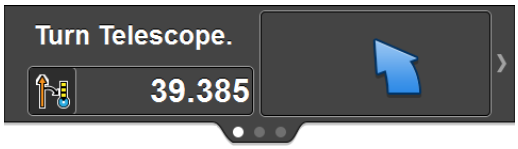
Displays information that is relevant to the current action being carried out. This will be in one of three forms:

- Guidance text whilst carrying out functions.

- Data from last made measurement.



- Directional guidance whilst staking out.

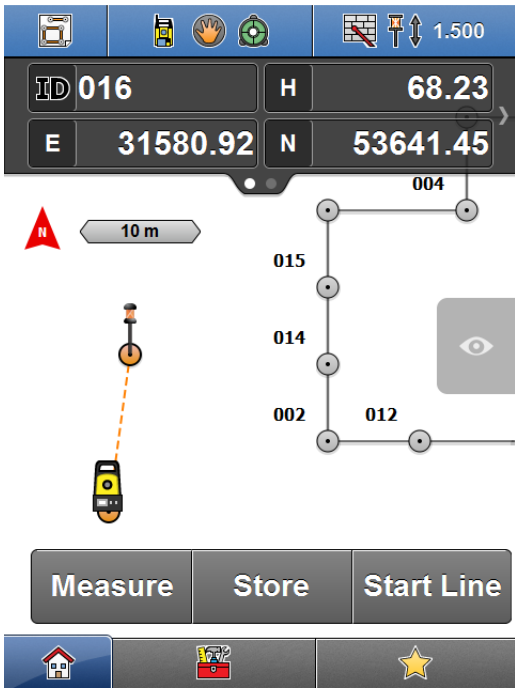


The white dots at the base of the Information bar indicate the total number of active pages, which can be scrolled through by tapping on the left hand side or right hand side of the Information bar.

The display format and content of the Information bar can be configured according to your preferences by **tapping and holding** for two seconds within the Information bar area. A menu is displayed where you can define the number of pages in the Information bar, and the amount of content on each page.

Main map area

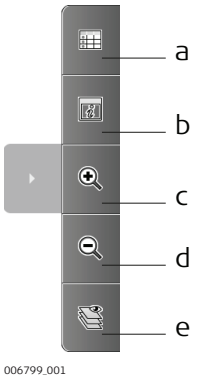
The main area of the screen displays all points, lines, and arcs that have been measured, as well as any other data that is loaded to the active job. The map area can be panned at all times.



Map handler

The Map handler is available whenever the **Map screen** is open. When not selected, it appears as a small tab: .

When the tab is selected, it is expanded to display the full extent of the Map handler, consisting of five keys:



a) Point List, including Point search
b) Automatic Centring, Toggle between Map view and Arrow view, Orientation Configuration, Viewing options, Configure the 7" multiview display
c) Zoom in, Smart Zoom
d) Zoom out, Zoom to full extent
e) Map View manager

Key	Description
Point List, including Point search	Shows a list of points. Points can then be edited, created, deleted, but also certain properties can be edited for points, the same value can be applied to multiple points. Allows you to make a Point search. Refer to "2.4 Point List, Searching for a Point" for more information.
Automatic Centring, Toggle view, Orientation Configuration, Viewing options, Configure multi-view	Turn **Automatic Centering** of the measured position **On** or **Off**. Toggle between **Map view** and **Arrow view** in the main map area. Use **Orientation Config** to define the view direction of the Arrow view and the Bullseye view. Use **Viewing Options** to configure which attributes are shown for each point in the map. Allows you to configure the **7" multiview display**.
Zoom in, Smart Zoom	Zoom in. Smart Zoom: **Tap and hold** to enable Smart Zoom functionality. Refer to "1.6.3 Smart Zoom" for more information.
Zoom out, Zoom to full extent	Zoom out. **Tap and hold** to display full extent of loaded data.
Map View manager	Select which data from the active project is displayed in the Map screen. Refer to "Map View manager" for more information.

☞ In 7" display format, the full extent of Map handler is always visible at the bottom of the screen. The small tab, used to show and hide the Map handler, is not present.

Measure bar

The Measure bar contains the main commands you will use whilst working, for example **Measure**, **Store**, and **Code**. It consists of between one and three keys, for example:

You can configure the content of the keys according to how you want to work.

Tap and Hold on the Measure bar for two seconds to configure. A configuration menu opens, where different commands can be specified. Available commands differ slightly, depending on the open application.

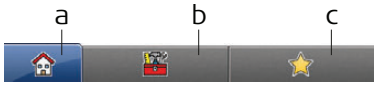
☞ For some tasks the Measure bar will be automatically altered to allow for the operation to be completed. Once the task is finished, the Measure bar will return to the user defined state.

☞ Information about Favourites menu configuration:

- Within the Measure bar configuration screen, **Tap and Hold** any key to add it to the **Favourites** menu. This provides easy access to the functions you are likely to use regularly.
- To remove a key from Favourites, open the **Favourites** menu, and **tap and hold** the relevant key.

Function bar

The Function bar contains a link to the Home Menu, and all functionality relevant to the open application. It also contains a calculator, and in some applications it will contain a link to Setup. Depending on the open application, function and appearance of the Function bar differs slightly.



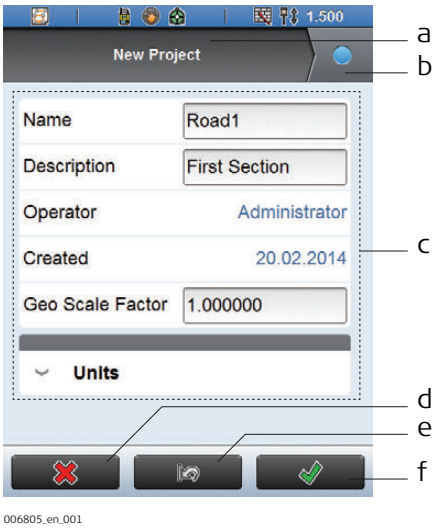
006802_001

a) Home key
b) Toolbox
c) Favourites

Key	Description
Home key	Navigates back to the Home Menu.
Toolbox	Contains functions relevant to the open application.
Favourites	Contains different functions that can be defined according your requirements. Refer to "Measure bar" (Information about Favourites menu configuration) for information about configuring Favourites.

Wizards

A number of Wizards facilitate common works. Each Wizard leads you through a series of steps, where settings and statuses can be changed.



☞ As an example, the **New Project** Wizard is displayed.

a) Current Wizard step
b) Next Wizard step
c) Wizard step content
d) Cancel and exit
e) Reset to default settings
f) Accept changes and exit

Element	Description
Current Wizard step	Shows title of Wizard step that is currently displayed.
Next Wizard step	Move to next Wizard step by tapping this key. It is only possible to move to the next step once all required fields are defined in the current setup.
Wizard step content	Settings that can be edited by tapping each individual key.
Cancel and exit	Exits the Wizard immediately, with no changes saved.
Reset to default settings	Resets all changed settings back to default value.
Accept changes and exit	Save changes and close Wizard. Only active once all Wizard steps have been completed.

1.3 Icons

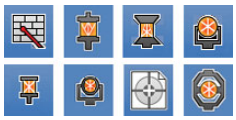
Description

Icons provide information related to basic instrument and controller status. Displayed icons depend on which instrument is used, and the instrument configuration.

Status bar: General icons

Icon	Description
	Indicates connected instrument.
	Indicates memory or data storage device type. Displayed in the Battery & Memory screen, accessible through Status 1 or Status 2.
	Indicates battery status.

Status bar: Total Station specific icons, TPS

Icon	Description
	Indicates prism lock setting.
	Indicates the selected prism.
	Indicates prism height setting. Allows to define two user settings for prism height.
	Indicates measure mode.
	Indicates compensator/level status.
	Indicates a geometric scale factor is applied.
	Indicates a PowerSearch is running.

Status bar: GPS specific icons, GPS

Icon	Description
	Position status Displays the current position solution: fixed, xRTK, float, navigated, and no position.
	Number of visible satellites Displays the number of satellites used in position calculation with the current satellite settings.
	Radio status Displays the real-time mode of the radio.
	Modem status Displays the real-time mode of the modem.

Status bar: iCON telematics icons

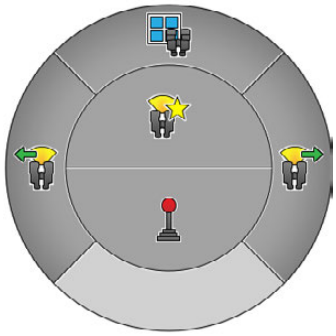
Icon	Description
	Internet connection not established.
	Internet connection established.
	Connected to the iCON telematics web page.
	Uploading data to the iCON telematics web page.
	Downloading data from the iCON telematics web page.
	Data transfer problem occurred.
	Remote view/control in progress.

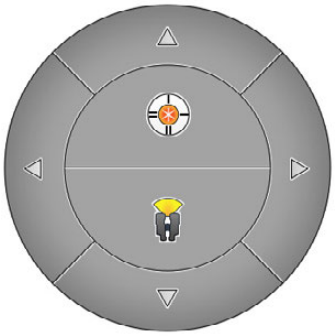
Map screen icons

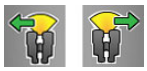
Icon	Description
	User Point
	Control Point
	Point being staked
	Staked and stored within tolerance
	Staked and stored outside tolerance
	Delete point
	Reference Line
	Staked Line
	Target point position. Measured; within tolerance; outside tolerance

Move & Search Pilot icons, TPS

The Move & Search Pilot is available in the **Status 2** menu.
It is only available when connected to a Robotic Total Station. It enables remote control of the vertical and horizontal rotation of the telescope on the Total Station. PowerSearch, an intelligent prism search method, can be triggered from this control.





Icon	Description
	Switch to Joystick control.
	PowerSearch left/right. Activates an intelligent prism search in the specified direction.
	Activates a PowerSearch of a predefined "window". This window can be defined in **Search Sector** in Status 2.
	Activates a local PowerSearch. If no prism is found, a full PowerSearch occurs.
	Switch to PowerSearch.
	ATR search. Instrument searches locally for a prism.
	Moves instrument in specified direction. Tap key again to increase speed. Three speeds are available.
	Cancel current search.

☞ To close the Move & Search Pilot, tap outside the control, in the Map screen.

Instruments and connectivity

iCON site is pre-configured to be compatible with following Leica Total Station/GPS instruments:
Leica Builder, Leica iCON robot 50, Leica PowerTracker, Leica iCON builder 60, Leica iCON robot 60 and Leica iCON gps 60.

Name	Function	Connectivity with controller
Leica Builder	Manual Total Station	Cable, short-range Bluetooth
Leica iCON robot 50	Robotic Total Station	Cable, WLAN, short-range and long-range Bluetooth
Leica PowerTracker	Robotic Total Station	Cable, WLAN, short-range and long-range Bluetooth
Leica iCON builder 60	Manual Total Station	Cable, short-range Bluetooth
Leica iCON robot 60	Robotic Total Station	Cable, short-range and long-range Bluetooth
Leica iCON gps 60	GPS antenna and receiver	Cable, short-range Bluetooth

☞ WLAN is available for iCON site Plus only.

☞ For further information on the specific instrument, please refer to the associated manual provided with the product.

Data storage, connectivity of controller

Both the 3.5″ and 7″ controllers can record and store data internally. Data can be transferred to an Office PC using a USB connection.

Device	Internal storage
3.5″	8 GB flash drive
7″	128 GB hard drive

☞ For further information on the specific instrument, please refer to the associated manual provided with the product.

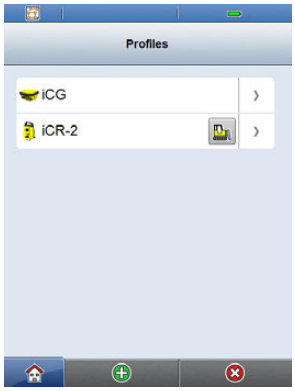
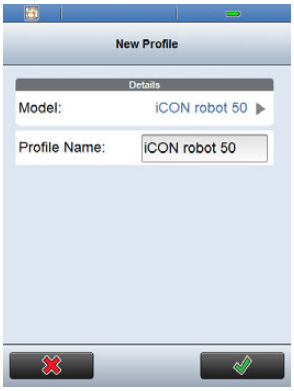
Firmware updates

Before installing any firmware updates, tap **System** and then **Active Licences** to check the maintenance status. Ask your agency or your Leica Geosystems representative for information about maintenance renewal.

☞ iCON site will conduct a maintenance check before any update installation.

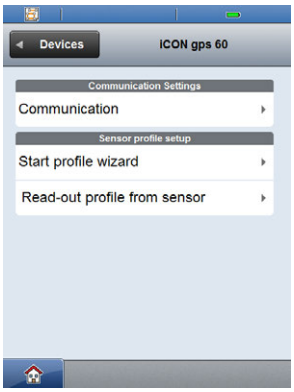
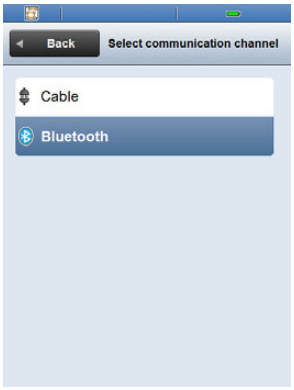
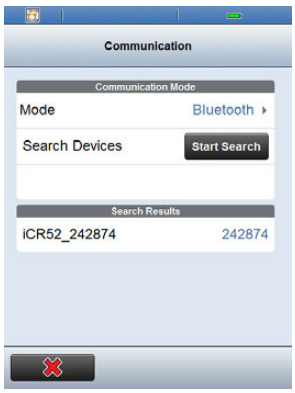
Create an instrument profile step-by-step

In order to connect the controller to an instrument, an instrument profile must be created.

Step	Description
1.	Press **Devices** in the Home Menu. Tap ⊕ to create a new profile. 
2.	Select the **Model:**, and enter a **Profile Name:**. Tap ✓. 

☞ For a GPS profile proceed to "1.5.2 GPS Profile Setup". For a Total Station profile proceed to "1.5.3 Total Station Profile Setup".

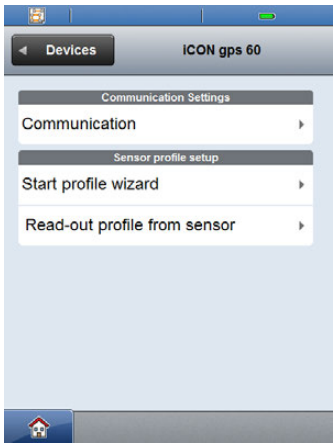
Define communication method step-by-step

Step	Description
1.	To define the Communication method between instrument and controller tap **Communication**, within the **Communication Settings** container. ☞ Ensure the GPS instrument is set accordingly. 
2.	• For **Cable** connection, ensure the cable is connected. The connected instrument is displayed in **Search Results**. • For **Bluetooth**, press the **Start Search** key. Select the relevant instrument profile from **Search Results**.  
☞	Once the instrument is connected, it changes from white to blue in the search list. Tap ✓.

Sensor profile setup

To create a GPS Profile, additional settings must be defined. Select from these two Profile Setup modes:

- **Profile Wizard**: Set up most of the common configurations for Base, Local Rover and Network Rover. Includes optional access to additional settings.
  It is also possible to complete a Profile Wizard before connecting to the instrument.
- **Profile from Sensor**: Automatically creates a new profile with the settings that are currently set on the instrument. Work with the instrument can begin immediately.



Profile Wizard

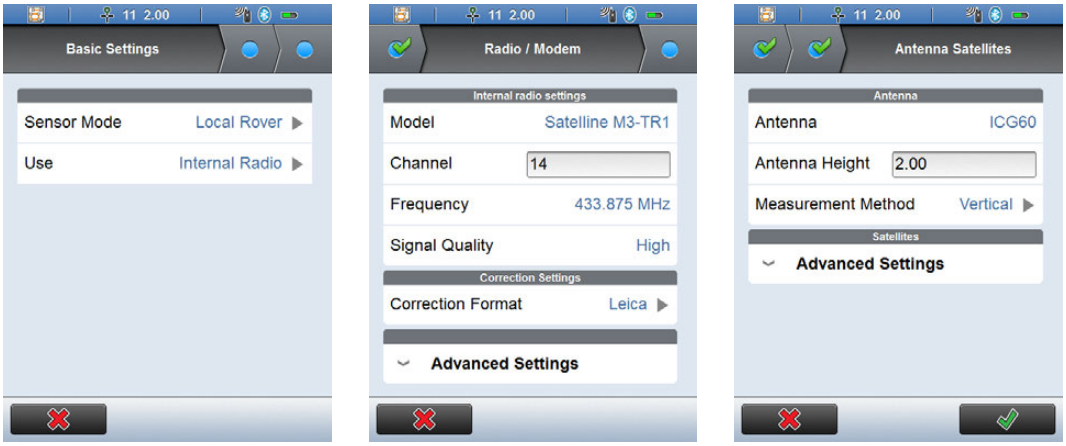
The Profile Wizard consists of three steps:

- **Basic Settings**: Set **Sensor Mode**, and **RTK Device Use**.
- **Radio / Modem**: Define **Radio / Modem** settings, and **Correction Format**.
- **Antenna, Satellites**: Define **Antenna** and **Satellite** settings.

☞ To receive RTK corrections via tablet select **iCG60 Modem** as the RTK Device **Use** in the **Basic Settings** screen.

☞ For Satel radios the frequencyc can be changed.

☞ The software supports **GPS L2C**, **GPS L5**, **Glonass**, **Galileo**, and **Beidou**.

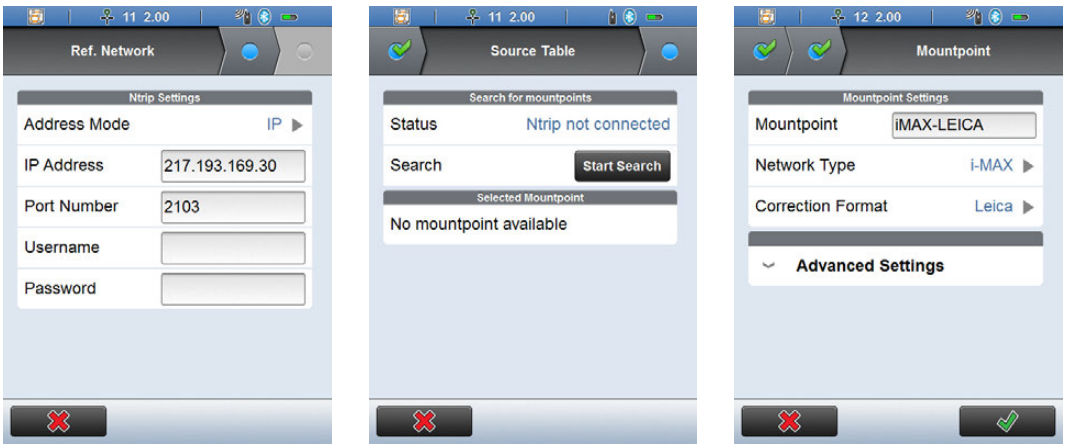


Expand **Advanced Settings** to make additional selections where relevant. Tap when step 3 is completed.

The following table describes the two different antenna height measuring methods:

Method	Description
Vertical	The vertical height reading is the height difference between the bottom end and the top end of the pole.
Height Hook	If setting up using a tripod, the measurement required is the vertical height from the height hook to the ground.

☞ If setting up a **Network Rover** with **NTRIP connection** to a reference network, a further three Wizard steps will be shown:



☞ After creating a Base profile, there is an option to navigate directly to Base Station Setup. Refer to "5 How to Setup a GPS Base Station" for more information.

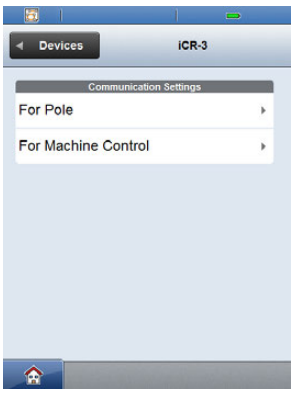
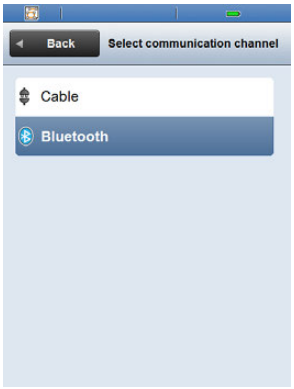
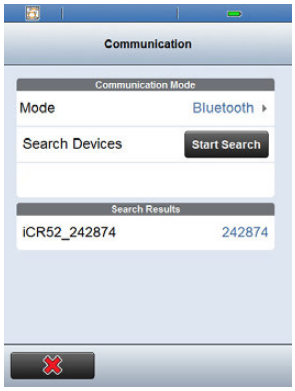
☞ Once a profile has been created, connection to the instrument is automatically established each time the software is launched. This is providing that the instrument is turned on with the correct communication method, and the relevant instrument profile is selected in the **Profiles** screen.

☞ To edit profile settings later, tap the arrow to the right of the profile name in the **Profiles** screen.

1.5.3 Total Station Profile Setup

TPS

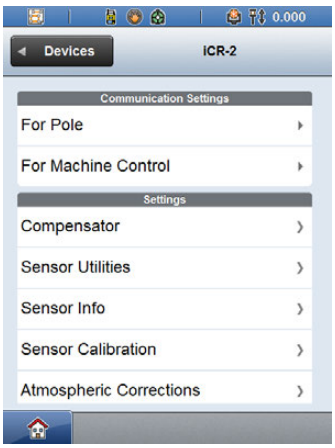
Define communication method step-by-step

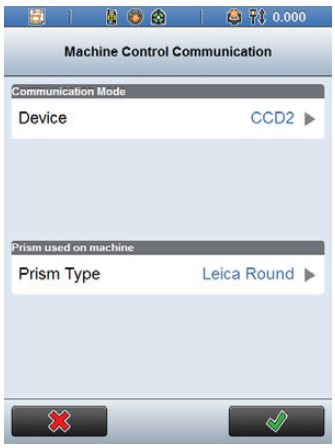
Step	Description
1.	To define the Communication method between instrument and controller select **For Pole**, within the **Communication Settings** container. ☞ Ensure the Total Station is set accordingly. 
2.	• For **Cable** connection, ensure the cable is connected. The connected instrument is displayed in **Search Results**. • For **Bluetooth**, press the **Start Search** key. Select the relevant instrument profile from **Search Results**.  
☞	Once the instrument is connected, it changes from white to blue in the search list. Tap .
☞	Once a profile has been created, connection to the instrument is automatically established each time the software is launched. This is providing that the instrument is turned on with the correct communication method, and the relevant instrument profile is selected in the **Profiles** screen.
☞	To edit profile settings later, tap the arrow to the right of the profile name in the **Profiles** screen.

Machine communication

Within a Robotic Total Station profile it is also possible to define communication settings between **Instrument** and **Machine**.

Within the **Communication Settings** container, tap **For Machine Control**. From here, define the **Communication Mode** and the **Prism used on machine**. Tap ✓ when finished.



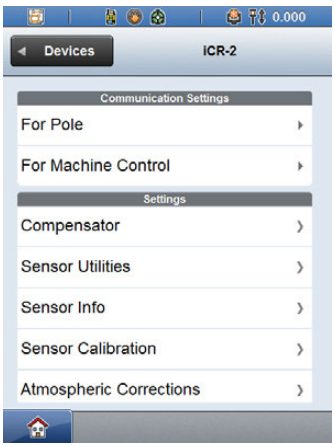


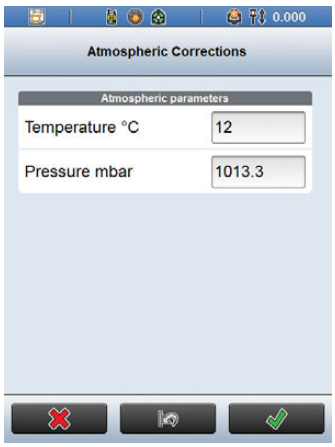
To switch from Survey Mode to Machine Control Mode, tap the Machine Control key on the profile name in the **Profiles** screen. A **Machine mode switch** screen is displayed while the switch is ongoing. Tap the key to switch back to Survey Mode.

Atmospheric corrections

Within a Total Station profile it is also possible to define atmospheric correction settings.

Within the **Settings** container, tap **Atmospheric Corrections**. Input the desired values for **Temperature** and **Pressure**. Tap ✓ when finished. To reset to default settings tap ⟲.

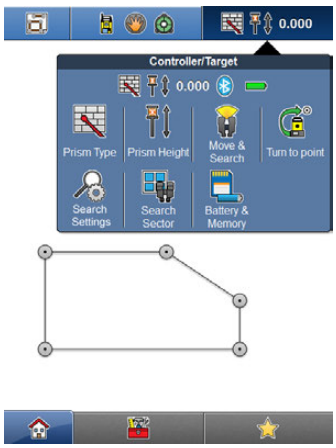




The values for **Temperature** and **Pressure** are displayed and must be entered according to the current unit settings.

Description

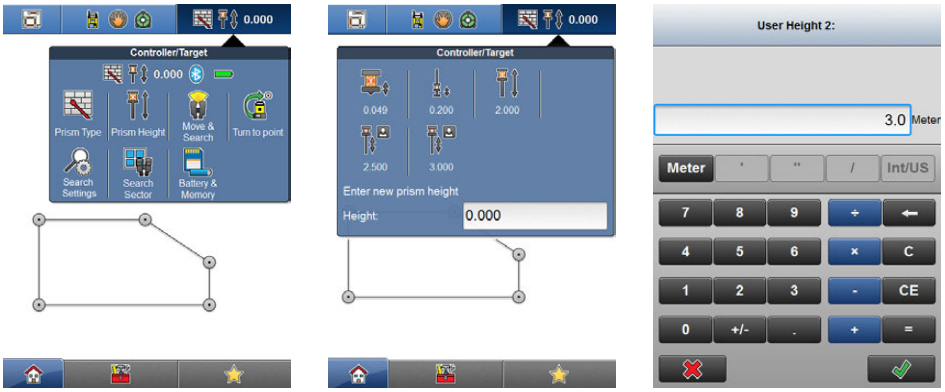
Settings for **Prism Type** and **Prism Height** can be found in the Status bar accessible from any application, except **Draw**.



Set prism type step-by-step

Step	Description
1.	From within the current application, tap 0.000 in the Status bar and select **Prism Type**.
2.	A sub-screen opens automatically, with the currently active prism type highlighted. Select the prism type you want to use by tapping the relevant symbol, for example **Leica 360**.
3.	The software proceeds with the current application and the newly set prism type active.
☞	For iCON robot 50/iCON robot 60 Machine Control the default prism type is the MPR122.

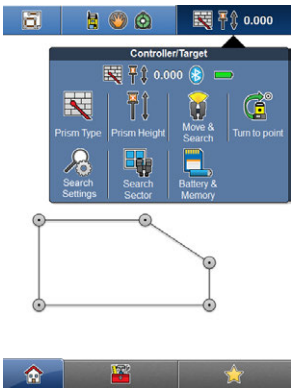
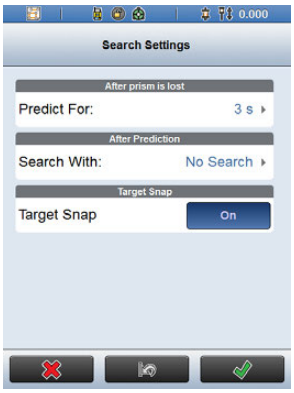
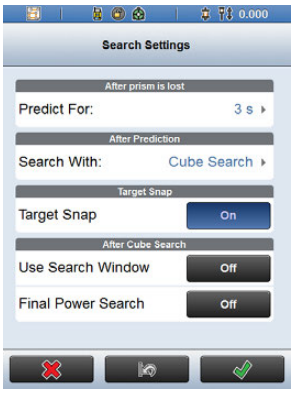
Set prism height step-by-step

Step	Description
1.	From within the current application, tap 0.000 in the Status bar and select **Prism Height** .
2.	Choose from pre-defined prism heights or type the height in manually by tapping on the relevant icon.
3.	To define the user defined prism height, **tap and hold** one of the relevant icons. The numerical keyboard pops up. Enter the desired height and tap to confirm. The new height is set under the user defined icon. ☞ To enter the prism height in another unit, first clear the entry field, then select the unit and finally enter the height value.
	
☞	When selecting reflectorless or tape the default height is set to 0.000 m. When selecting any prism mode again, the prism height is set back to the original setting.

Default prism heights

Prism type	Default height		
	[m], for CPR1 poles	[ft decimal], for CPR2/3 poles	[ft fractional], for CPR2/3 poles
Reflectorless, Tape	0.000	0.000	$0^0/_0$
MPR122 without pole	0.049	0.162	$0^5/_{32}$
MPR122 with pole plate or tip	0.200	1.000	$1^0/_0$
MPR122 with pole	2.000	6.500	$6^1/_2$
MPR122 User Defined 1 or 2	0.000	0.000	$0^0/_0$

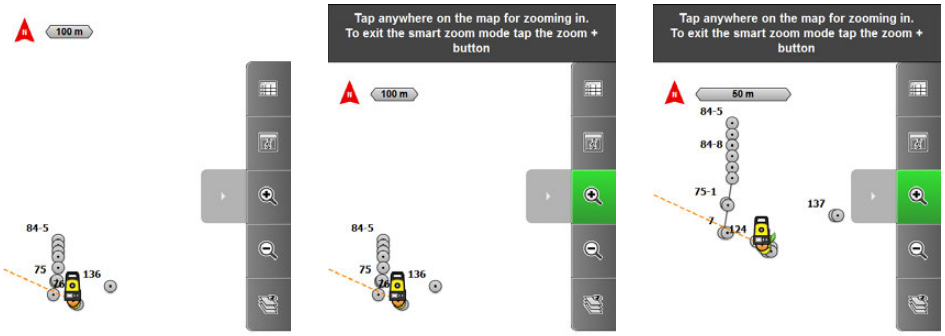
Automatic search settings step-by-step

Step	Description
1.	From within the current application, tap 0.000 in the Status bar and select **Search Settings** .
2.	In the **Search Settings** screen define the behaviour of the Total Station after a prism loss. • Define the time that the software calculates the predicted position of the prism at **Predict For:**. Within this defined time period, the system automatically searches for the prism at the calculated position. If no prism is found, the search at the Total Station is stopped or it continuos with the next option, according to the settings in **After Prediction**. • Additionally, with **After Prediction** define the behaviour of the Total Station when the prism is not found at the predicted position. Set **Search With:** to: – **No Search**, to start no additional prism search. – **ATR**, to start an ATR search. – **Powersearch**, to start a PowerSearch. – **Cube Search**, to start a dynamic PowerSearch. This is a search, performed in a cubic area with defined dimensions around the last known position. • To ban fixpoints from a PowerSearch set **Target Snap** to **On**. PowerSearch will then ignore prisms with known position. All prisms used for a station setup calculation and all measured control points are excluded from any PowerSearch. ☞ **Target Snap** can only be used with a iCON robot 60 Total Station and the according license.
3.	When using the **Cube Search**, additionally define the behaviour after an unsuccessful dynamic PowerSearch. • To start a search within the defined search window set **Use Search Window** to **On**. • Set **Final Power Search** to **On**, to start another - and final - PowerSearch. ☞ **Cube Search** can only be used with a iCON robot 60 Total Station and the according license.
	  

1.6.3 Smart Zoom

TPS + GPS

Enable Smart Zoom step-by-step

Step	Description
1.	**Tap and hold** from the **Map handler** to enable Smart Zoom functionality. The function is accessible in all applications and all map views. Map turns to Smart Zoom mode, turns to green, automatic centring is turned off.
2.	Tap anywhere on the map, where you want to zoom, even on blank space. Map is centred to the tapping area and zoomed in by one zoom level.
3.	Proceed as many times as desired. When the zoom limit is reached a warning is displayed.
	
☞	Smart Zoom functionality is not available, if the map is in **Bullseye** view, **Arrow** view, or **Cross Section** view.

Disable Smart Zoom

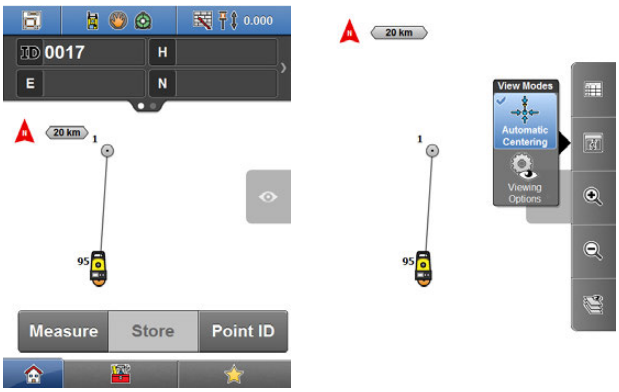
Tap the green to disable Smart Zoom functionality.

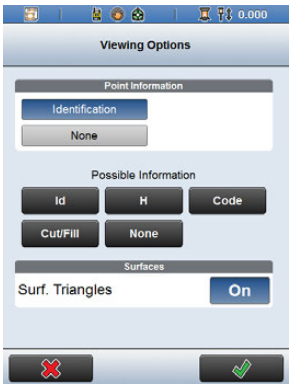
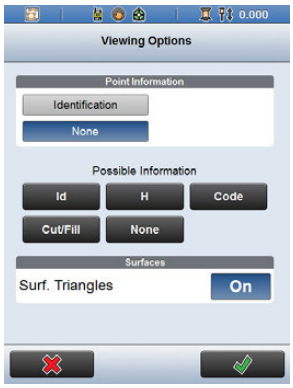
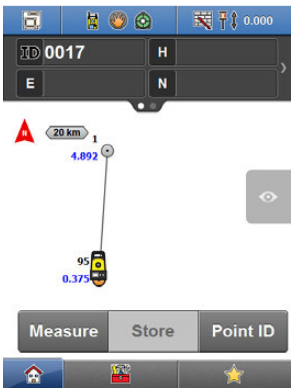
☞ Automatic centring remains off until manually turned on again.

1.6.4 Viewing Options

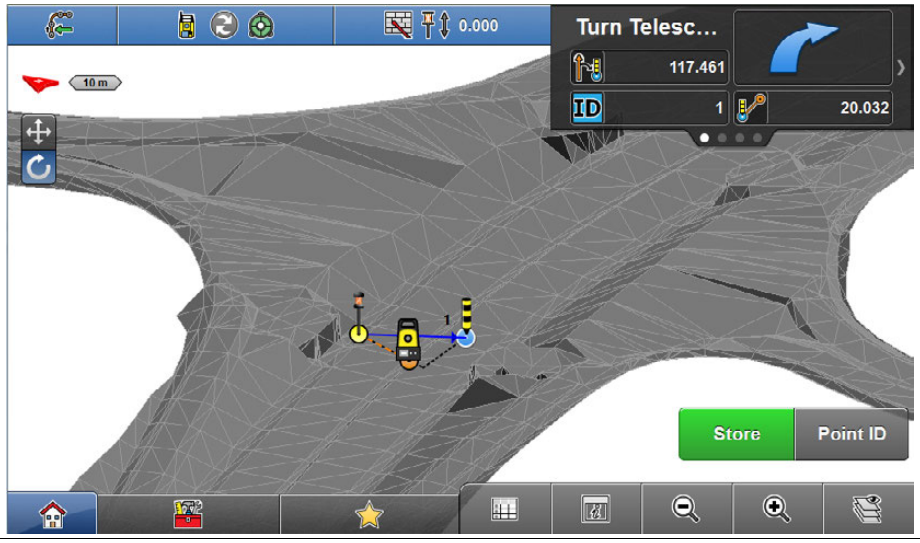
TPS + GPS

Selecting the point information in the map step-by-step

Step	Description
☞	By default, the sole information for a point shown in the map is the Point ID. Anyway, iCON site allows to configure to show two different information for all points in the map, one above and one below the point symbol.
1.	From within the current application, access **View Modes** in the Map handler and tap **Viewing Options**. 

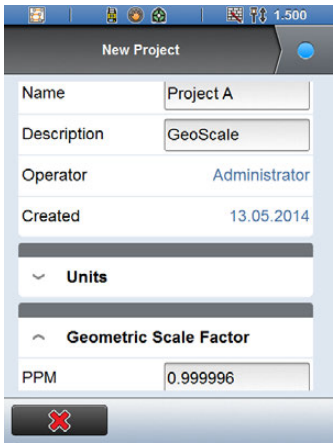
Step	Description
2.	Tap the position (upper or lower) you want to change the **Point Information** for, so that the current setting for this position is highlighted.  
3.	Now select the information you want to be displayed. Select from: – **Id**: The name or **Point ID** of the point. – **H**: The **Height** of the point. – **Code**: The **Code** (or layer name) of the point. – **Cut/Fill**: The stored **Cut/Fill** value for a staked out point. – **None**: No information is displayed at the selected position.
4.	If you also want to show the Cut/Fill colour indicators set **Surf. Triangles** to **On**.
5.	Tap to accept the settings and return to the map. 
☞	The settings for these viewing options are used, independent from the User, Project or Job. Anyway, it is possible to define and use different settings for the different applications.
☞	The information is shown according to the current settings, in the chosen distance unit and the number of decimals set.

Perspective view step-by-step

Step	Description
☞	When using iCON site in the 7" Landscape display format it offers a perspective view, except for **Draw**.
1.	To change from the standard Map view to a perspective view tap .
2.	Now it's possible to rotate the current view three-dimensional. The North indicator changes accordingly as well. 
☞	Tap to freeze the current perspective view and enable panning.
☞	Tap the **North indicator** to set the view back to the standard Map view.

Description

The geometric scale factor is used to correct distances for the distortion introduced by the use of map projection.
The geometric scale factor can only be set when creating a new project. Input the desired value at **Geo Scale Factor**.

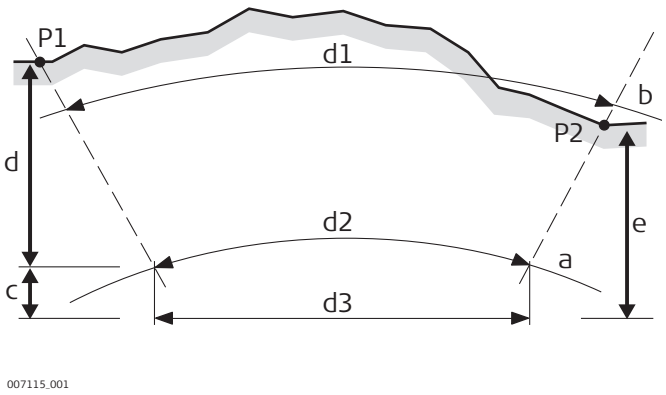


☞ The scale factor is displayed in the **Units** set.

☞ The entered scale factor value affects only all Total Station measurements, GPS measurements are not affected.

☞ An additional icon is displayed in the Status Bar, when a geometric scale factor is applied to a project.

Explanation



P1, P2 Known points
d1 Ground distance
d2 Ellipsoid distance
d3 Grid distance
a) Sea level
b) Elevation, 1000 m
c) Height Scale factor
d) Map Projection Scale factor
e) Combined Scale factor

Relation of ground distance to grid distance:

- Scale to central meridian and distance from central meridian defines the Map Projection Scale factor, while the height above reference defines the Height Scale factor.
- Both, the map projection and height scale factors define the PPM scale factor.

2 Projects, Jobs, Data, and Settings

2.1 Projects and Jobs

Projects and jobs overview

iCON site allows the simple location and transfer of data between **instrument**, **controller** and **office**.
Imported reference and control data is stored in iCON site, within individual **Projects**. **Jobs** can be created and carried out within these projects. **Reports**, **measured data** and **calculated results** are stored to the active job, ready for exporting.

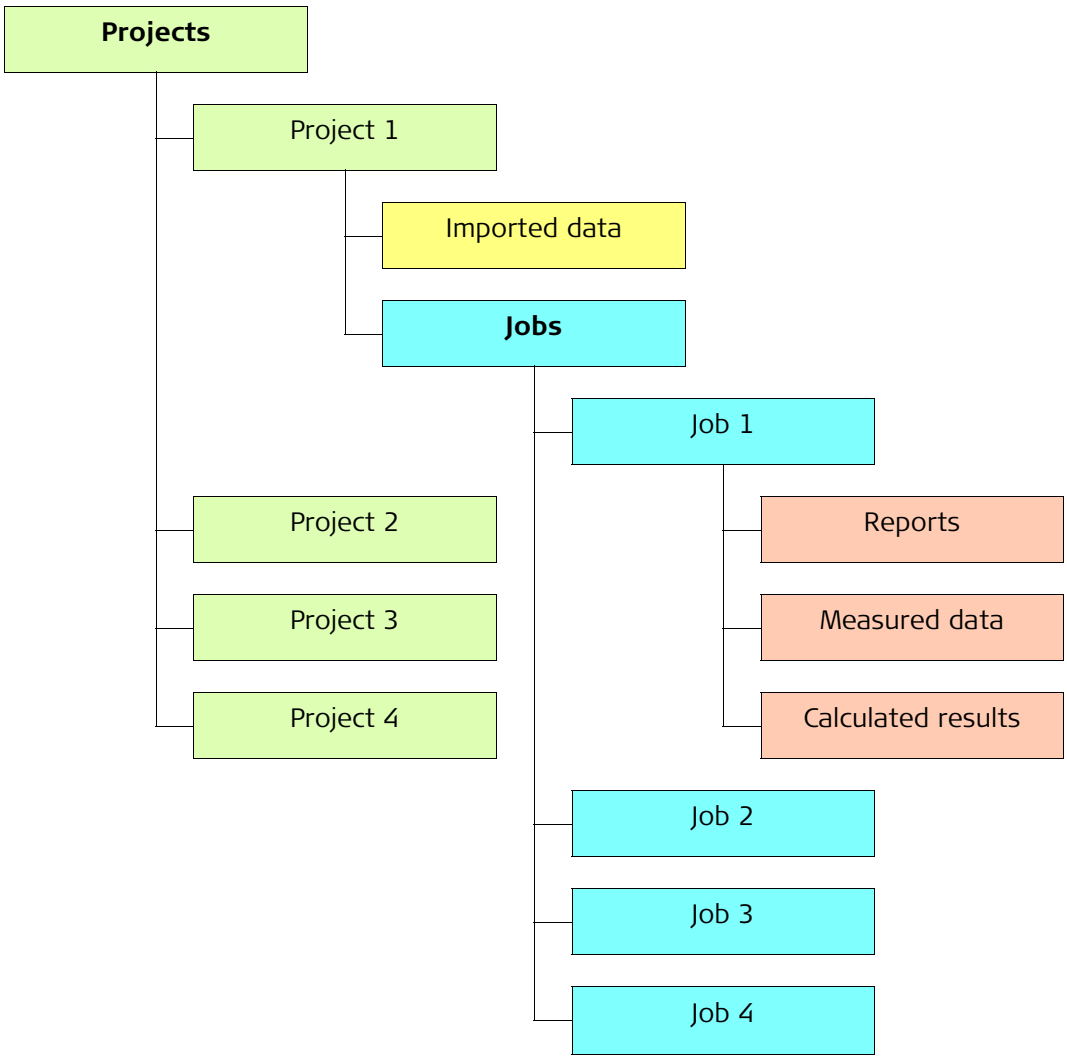
This allows you to create a project with specific reference and control data, and then carry out multiple jobs within this project.

Projects:
- Imported data
  - Control data
  - Reference data
  - Coordinate systems
  - Code lists
  - Road data
  - Background image

Jobs:
- Output:
  - Reports
  - Measured data
  - Calculated results

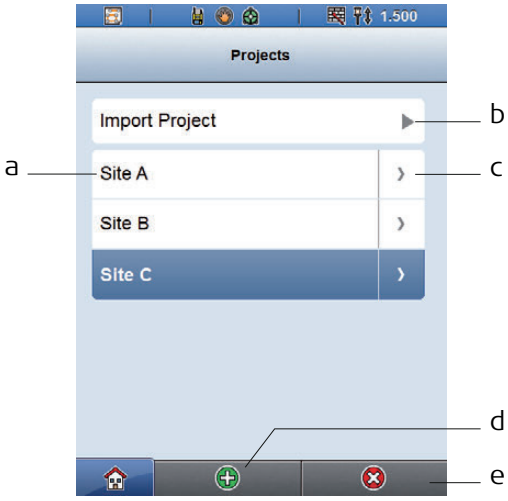
☞ Jobs are created within projects. All the importing is done to the actual project, and then available in all jobs within that project.

Example of a basic data flow/storage directory structure



To create, edit, select or delete a project, tap **Projects** in the Home Menu.

Projects page opens. The current active project is highlighted in blue.



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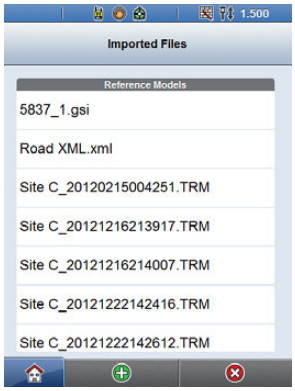
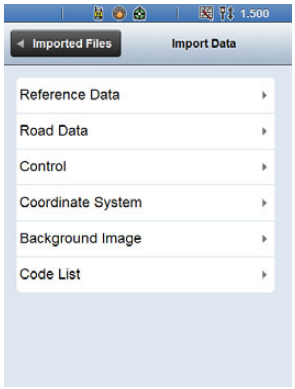
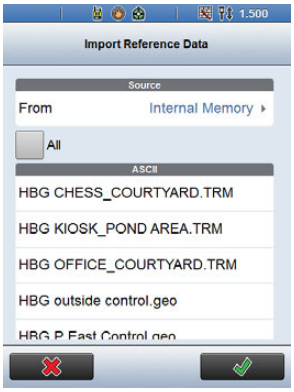
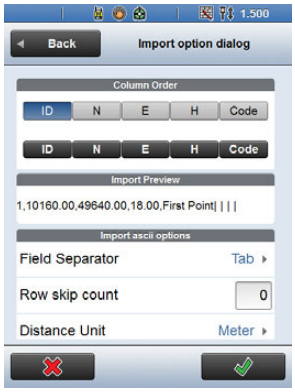
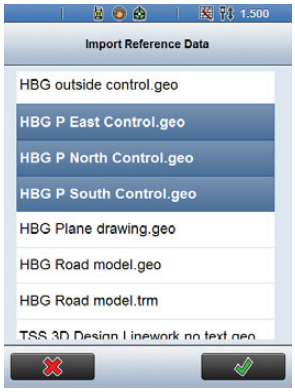
a) Select project
b) Import project
c) Edit project
d) Create new project
e) Delete project

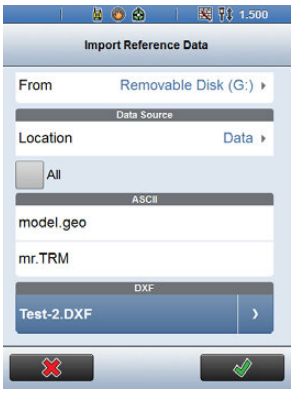
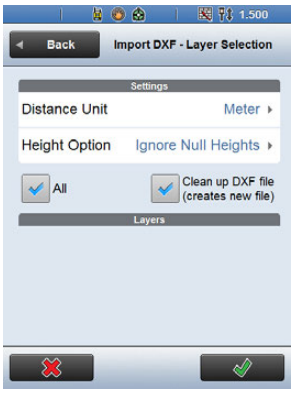
Key	Process
Select project	Selected project is automatically activated. Home screen opens automatically.
Import project	Complete projects can be imported to the current device.
Edit project	Previously made settings can be edited and saved. Further data can be loaded to a project.
Create new project	Follow the Wizard steps to load reference data, road data, control data, coordinate systems, background images, and code lists. To define the geometric scale factor, input the desired value at **Geo Scale Factor**.
Delete project	Individual projects can be deleted.

☞ Users with basic administrative rights cannot create, edit, or delete projects. Refer to "2.2 User Profiles" for more information.

☞ Data can also be loaded to the active project using **Import & Delete**, refer to "Importing data to the project step-by-step".

Importing data to the project step-by-step

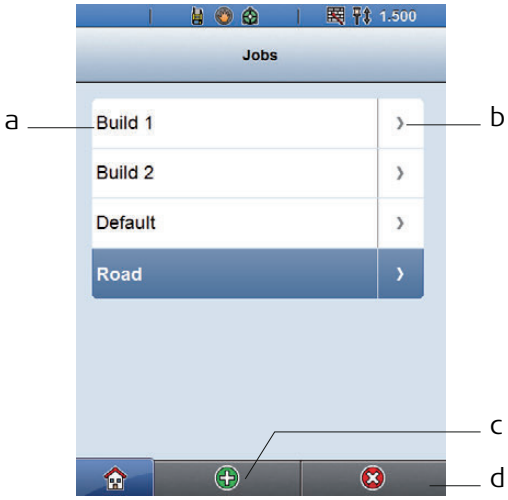
Step	Description
1.	Select **Import & Delete** from the Home Menu. All data that is already loaded to the active project is displayed. Tap to import further data. Select the type of data to import. Select from **Reference Data**, **Road Data**, **Control** data, **Coordinate System**, **Background Image** or **Code List**.  
2.	In the next screen, define the **Source** to import data. All data that is available for import is displayed. Tap each list item to select it for Import. For certain file types, an additional screen allows you to edit the import options (see 2nd screen). Once the required data is selected, tap to import. All selected data is imported, and available in the active project.   
☞	Specifically for **Coordinate Systems**: To import a coordinate system that is stored locally on the controller, set the **Source** to **Internal Memory**, and select the coordinate system from the list below. To use a coordinate system (“transformation set”) that is streamed from a reference network as part of a **RTCM3** or **LEICA4G** message, set the **Source** to **Via Network** (no further selection needed), and the controller will be ready to receive the coordinate system.

Step	Description
☞	Specifically for importing DXF files: The software offers an option to clean-up DXF files during import. Select the DXF file, then tap the arrow to enter the **Import DXF - Layer Selection** screen. Tap on the **Clean up DXF file (creates new file)** tick box and tap to accept. After a successful import a message is displayed, informing about the "cleaned-up" file size as well.  

Creating, editing, selecting and deleting jobs follows the same process as with projects.

Tap **Jobs** in the Home Menu.

Jobs page opens. The current active job is highlighted in blue.



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a) Select job
b) Edit job
c) Create new job
d) Delete job

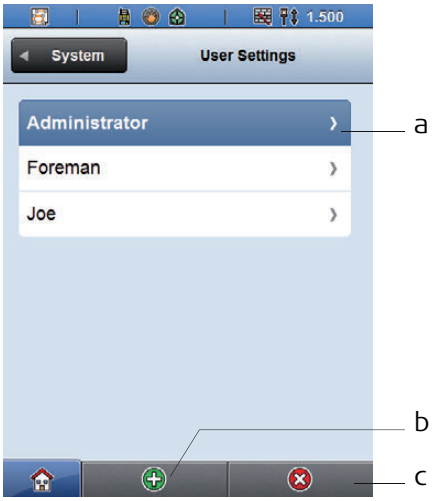
Key	Process
Select job	Selected job is automatically activated.
Edit job	Previously made settings can be edited and saved. Data can be activated.
Create new job	Create new job Wizard. Available data can be activated here.
Delete job	Delete jobs.

☞ Imported data can also be activated using **Map view manager**, refer to "2.3 Displaying Data".

User profiles

It is possible to create multiple users on the same device.

Tap **System** in the Home Menu. Select **Users**.



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a) Edit user
b) Create new user
c) Delete user

Key	Process
Edit user	Previously made settings can be edited and saved.
Create new user	Create new user Wizard. ☞ New users can only be created by a user with **administrative rights**.
Delete user	Delete screen opens.

When creating a new user, the level of access can be defined. Permissions of the three user levels are as follows:

- **Administrator:**
  Complete functionality of the software. Can access all applications, and edit all data and settings.
- **Advanced:**
  Key functionality of software. Can access all applications, and edit majority of data and settings.
- **Basic:**
  Basic functionality of software. Can access major applications, and create/delete specific jobs. No other permissions.

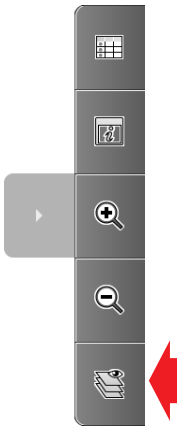
☞ To change the active user, logout using the power key in the Home Menu, then login as the relevant user.

☞ For any user profile, input the password "superagent" when logging in to enable administrator access rights for that profile.

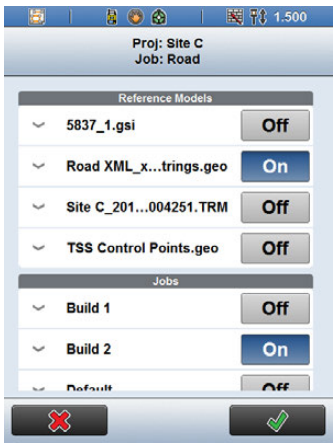
Map View manager

Select **Map view manager** from the **Map handler**.

The Map handler is displayed in all applications. All data loaded to the active project can be activated and displayed using Map View manager.



To select which data you would like displayed, toggle the **On**/**Off** key relevant to each data set.

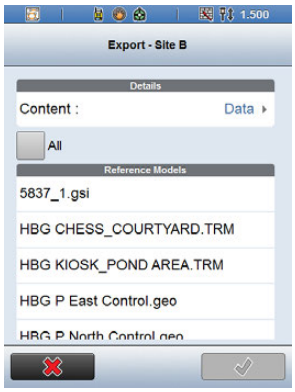
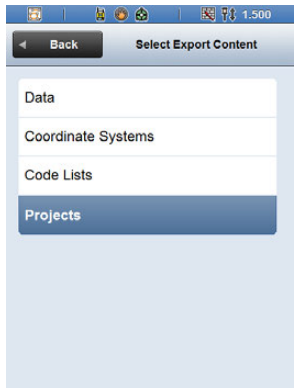
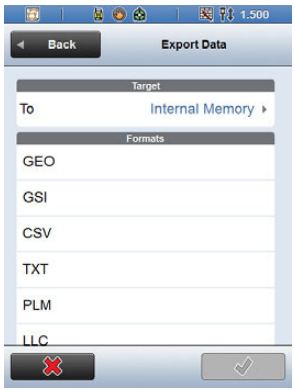
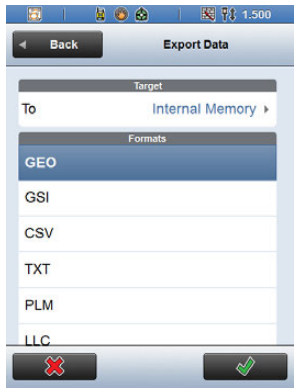


☞ Map View manager only contains data loaded to the current active project. If further data is required, it must first be loaded to the active project.

☞ If codes are included in the imported data file, they can be accessed using a drop down arrow, and individually turned On/Off.

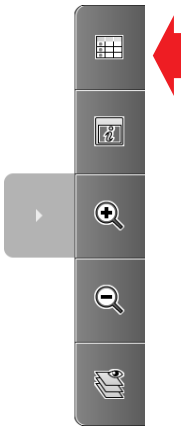
Exporting data step-by-step

It is possible to export content to the internal memory, or to a connected storage device.

Step	Description
1.	Select **Export** from the Home Menu. The Export screen is displayed. Define the content to be exported by tapping **Details**. Select from **Data**, **Coordinate Systems**, **Code Lists**, **Projects**.  
2.	The relevant content available to be exported is then displayed in the screen. Tap each individual list item to select, then tap . It is possible to select multiple list items. In the following screen, define the destination of the exported content in **Target**. Select the file format to export, then tap . The content is exported as specified.  

File List and Point List

Select **Point List** from the **Map handler**.



This function is available in every application that requires the user to select a point from the map.

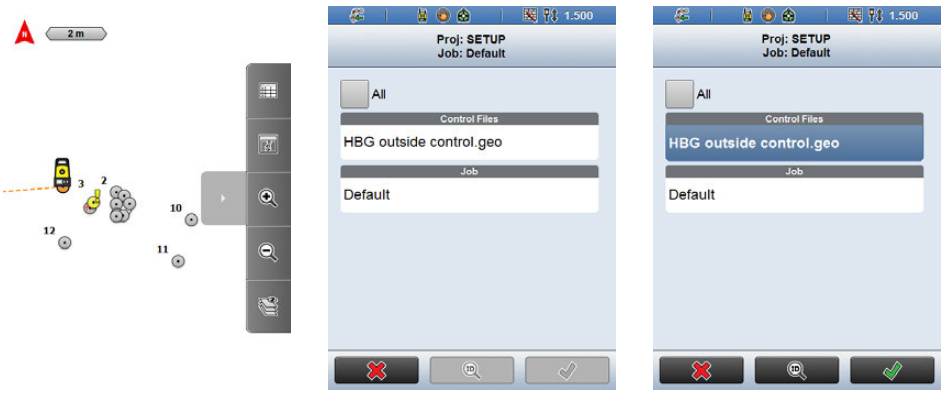
With this helpful tool it is possible to:

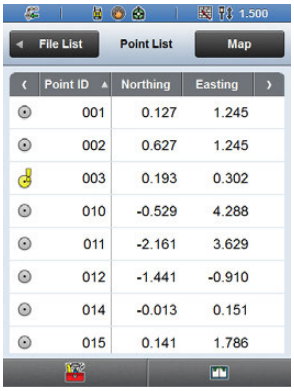
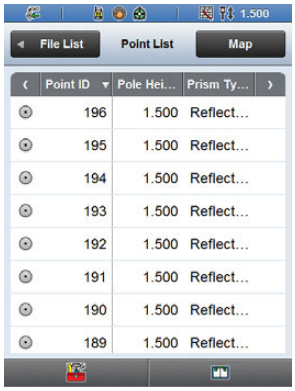
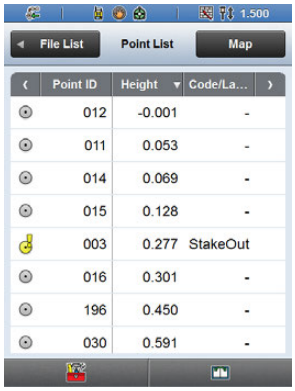
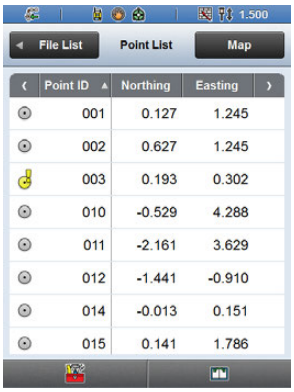
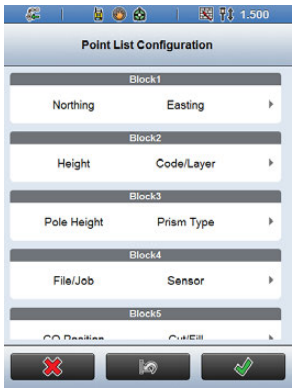
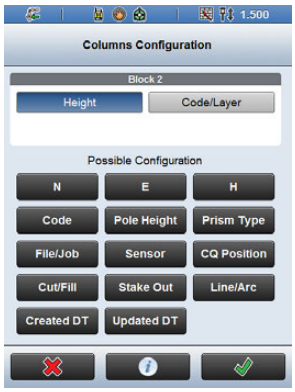
- edit, create or delete points in every application,
- edit point ID, code, prism type and prism height of measured data,
- apply the same value to multiple points,
- define how and based on which attribute the Point List is sorted.

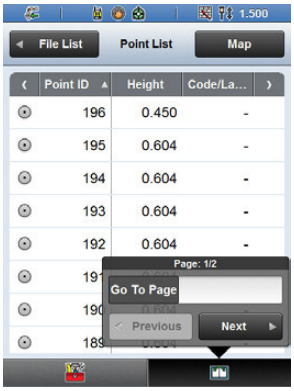
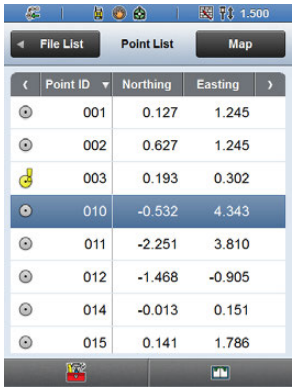
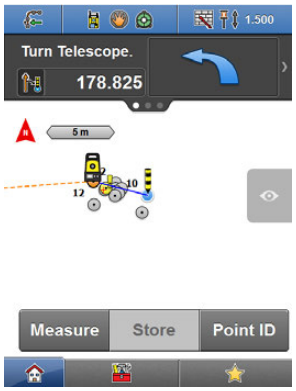
☞ The column order (**E, N, H** or **N, E, H**) corresponds to the setting in **Coordinate Order** (**System** › **Display** › **Coordinate Order**).

☞ Attribute values are displayed in the **Units** and the display mode set (two, three, or four decimals, found in **System** › **Display** › **Mode**).

How to use Point List step-by-step

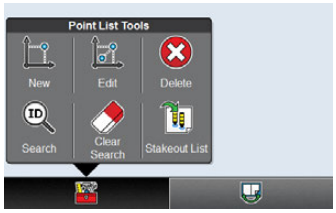
Step	Description
1.	Select **Point List** from the **Map handler**. A list of available files is opened. Select the files you want the Point List to be created for. Multiple file selection is possible. Tap to accept the selection and proceed to the Point List. 

Step	Description
2.	The Point List for the current selection is shown. • The relevant point status is shown in the left hand column. • Use ‹ or › to display further data of the shown points. ☞ Point status and Point ID are always displayed. • Use ▼ or ▲ to change between increasing/decreasing sort order. • To sort the list according to another value, tap the relevant header, for example **Height**. • Tap **File List** to return to the selection of files.   
3.	To change the order of the columns, **tap and hold** one of the column headers, for example **Northing**. In the **Point List Configuration** screen select the Block you want to change the order for, for example **Code/Layer**. In the **Columns Configuration** screen select the value you want to replace (for example **Code/Layer**) and the new value to use. Tap ✓ to confirm the settings.   

Step	Description
4.	If more than one page is available tap . In the pop-up menu use **Previous** or **Next** to display the corresponding page or enter page number directly. To get one certain point displayed in the map, select that point and tap **Map**. The map is displayed and the selected point is highlighted. ☞ A point can only be displayed in the map that way in applications like **Stakeout**, when a point selection is needed.   

Toolbox functions

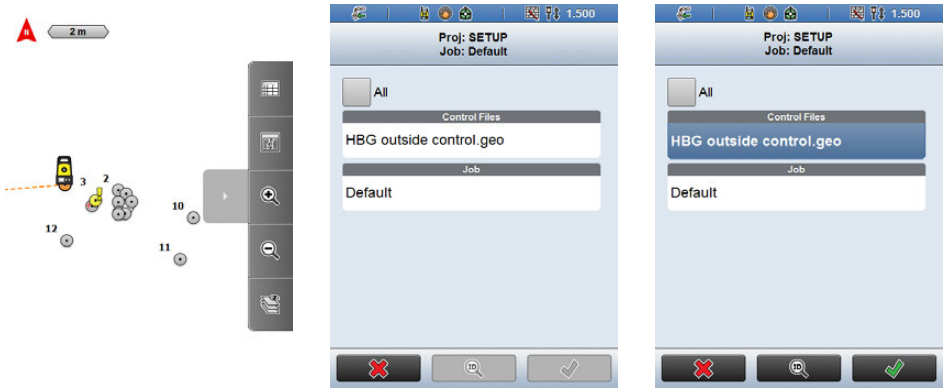
The Toolbox contains some additional functions.



Function	Description
New Point	Create a new point, by entering the required values: **Point ID**, **Easting**, and **Northing**. **Height** is optional but needed for all 3D applications. A new point can also be created with **Point ID** and **Height**, to be used to Transfer Height during Total Station setup. **Code** can be entered and the point can be defined as **Control Point** by setting the **Create Control Point** key to **On**. ☞ If you select a point before selecting this tool all relevant attributes are derived for the new point.
Edit Point	Select a point, then use this tool to edit values of the point: **Point ID**, **Easting**, **Northing**, **Height**, and **Code**. **Prism Type** and **Pole Height** is available for measured points. Multiple file selection is possible. Tap to accept, then confirm the following warning message.
Delete Point	Either first select the point to delete and then the delete function or reversed. Multiple file selection is possible. Tap to accept, then confirm the following warning message.
Search	Start a Point Search. Refer to "Start a Point Search step-by-step" for more information.

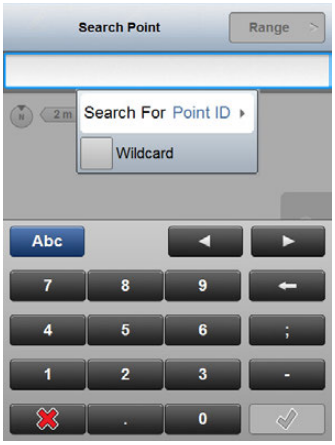
Function	Description
Clear Search	Clears the results of the last Point Search and displays the full content of the selected files again.
Stakeout List	To use the **Auto Point Selection** function to stake points automatically, it's necessary to define the list of points using **Stakeout List** first.

Start a Point Search step-by-step

Step	Description
1.	Select **Point List** from the **Map handler**.
2.	Select the file you want to search for points. Multiple file selection is possible.
3.	Tap to open the Point Search keyboard and start point search.
	

Point Search keyboard

By tapping **Point List** from the **Map handler**, selecting a file and tapping a keyboard screen appears allowing the configuration of a search.



- **Search for**:
  This context-list allows the user to define the attribute that is searched for. Three options are available: Point ID, Code and Elevation.
- **Wildcard**:
  This tick box allows the user to search for Points which's selected attribute (Point ID or Code) include the input text.
- **Range**:
  Allows the user to define the end value for a range search.

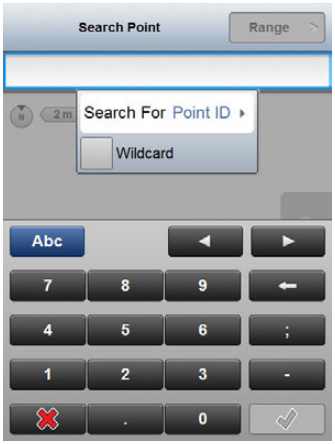
Point ID Search

Three options are available for the Point ID search:

- Exact Point ID Search
- Wildcard Point ID Search
- Point ID Range Search

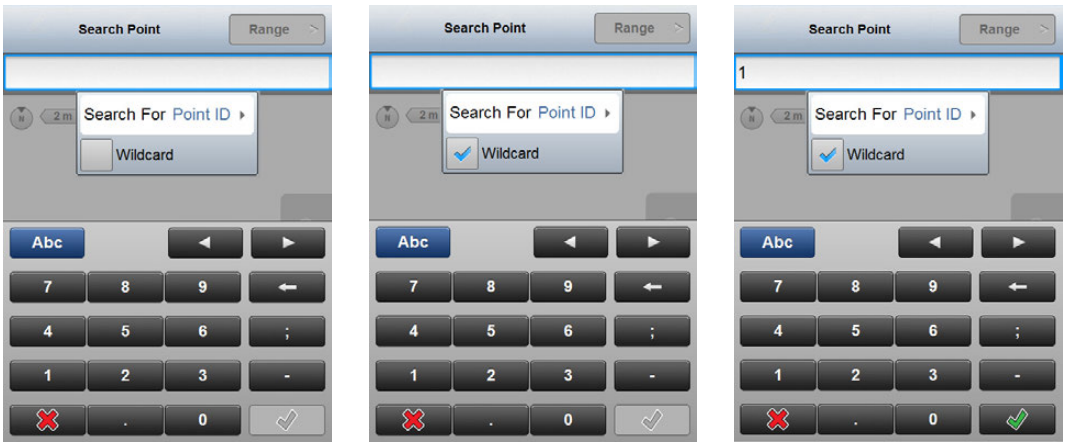
Exact Point ID Search

Tap on the **Search for** row and select **Point ID** for the search. Input the desired value and tap to accept.



Wildcard Point ID Search

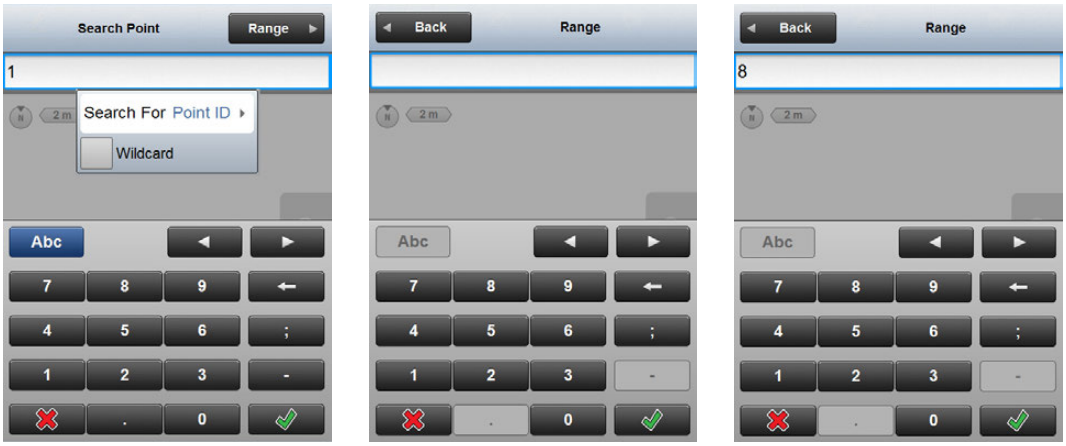
Having selected **Point ID** as the **Search for** option, tap on the **Wildcard** tick box. Input the desired value and tap to accept.



☞ The result of this search will be a list of points which's IDs include the input text.
For example, if you make wildcard search for point ID 1, the result may be: 1, A1, 10, 212, 301, and so on.

Point ID Range Search

Having selected **Point ID** as the **Search for** option, make sure the **Wildcard** tick box is deselected. Input the desired value and press the **Range** key. A second keyboard screen appears allowing to input the End value for the Range Search. Tap ✓ to accept.



Point ID Range search is available for numeric input values only. For letters or mixture of letters and numbers, this type of search is unavailable.

The result of this search will be a list of points whose IDs fall within the specified range.

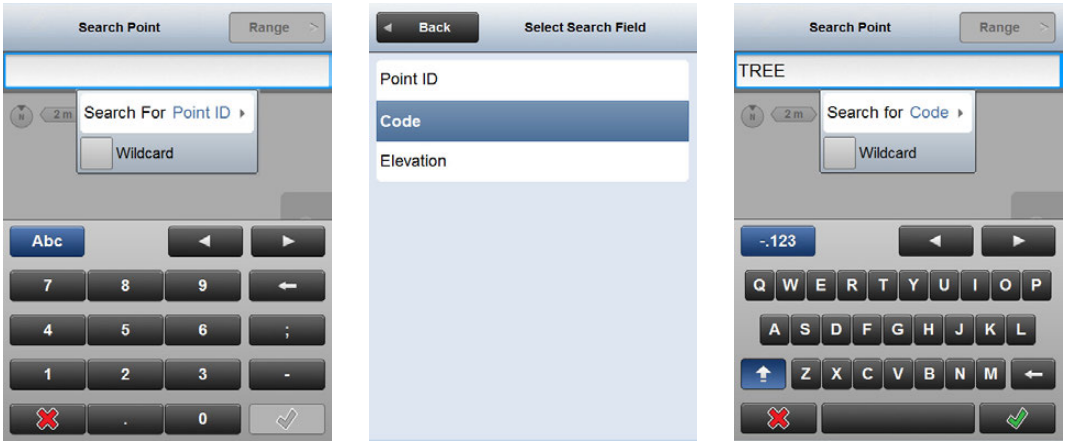
Code Search

Two options are available for the Code search:

- Exact Code Search
- Wildcard Code Search

Exact Code Search

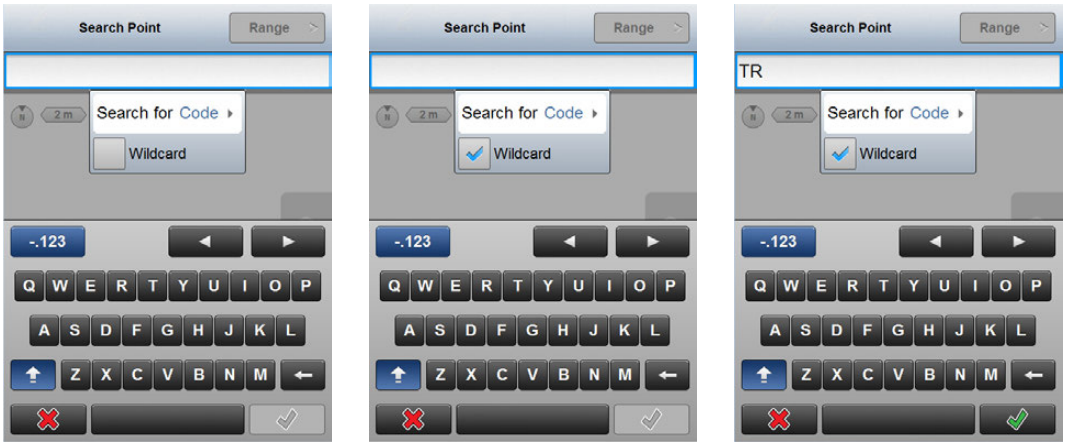
Tap on the **Search for** row and select **Code** for the search. Input the desired text and tap ✓ to accept.



The result of this search will be a list of points which all have the same Code.

Wildcard Code Search

Having selected **Code** as the **Search for** option, tap on the **Wildcard** tick box. Input the desired text and tap ✓ to accept.



☞ The result of this search will be a list of points which's Codes include the input text.

Elevation Search

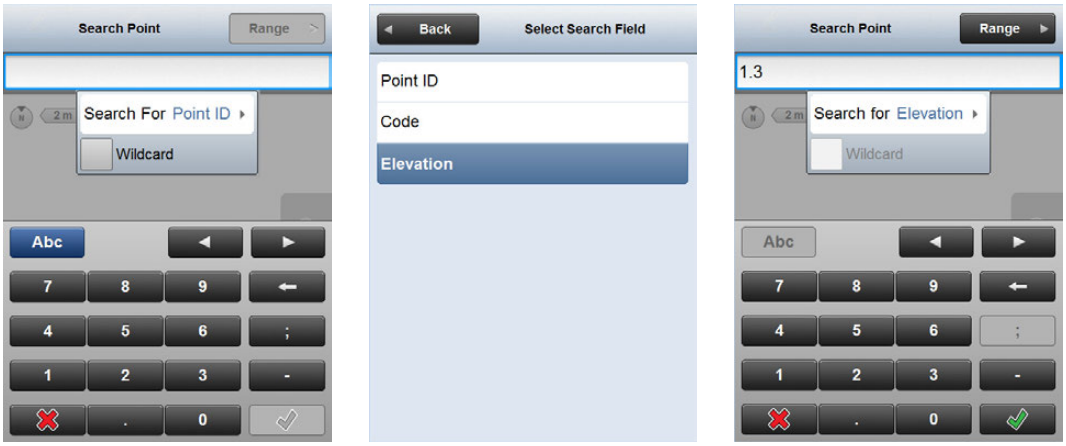
Two options are available for the Elevation search:

- Exact Elevation Search
- Elevation Range Search

☞ Wildcard search is not an option for the Elevation search.
☞ Only numeric values can be the input for the Elevation search.
☞ Negative height can be input by tapping - first and then the desired value.

Exact Elevation Search

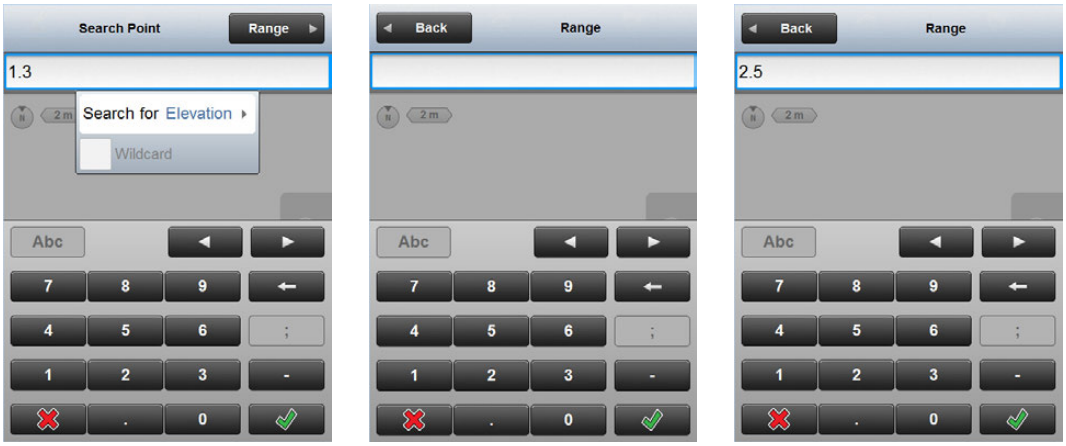
Tap on the **Search for** row and select **Elevation** for the search. Input the desired value and tap ✓ to accept.



☞ The result of this search will be a list of points whose Height is equal to the input value.

Elevation Range Search

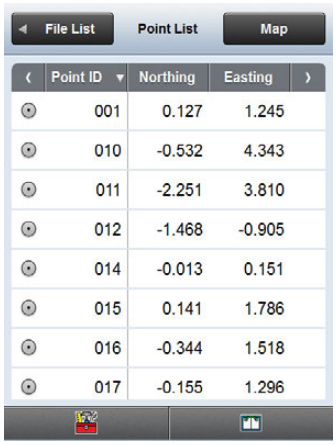
Having selected **Elevation** as the **Search for** option, input the desired value and press the **Range** key. A second keyboard screen appears allowing to input the End value for the Range Search. Tap ✓ to accept.



☞ The result of this search will be a list of points whose Heights fall within the specified range.

Search Results List

The result of any Point Search is a list of points that fit the search criteria. An example of such a search results list is shown.
Refer to "How to use Point List step-by-step" for more information about changing the sort order, viewing different values and further functions.

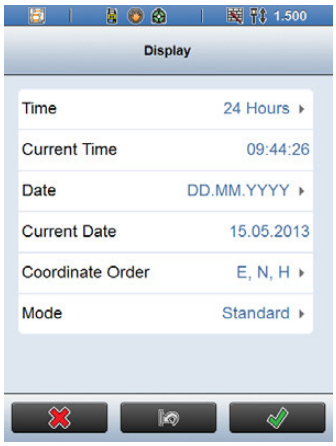


☞ By selecting a point from the results list and tapping **Map**, the map screen appears and the selected point is active, ready to be used within the application.

☞ In case the search output is more than 500 points, an information screen appears. Confirm that screen to display the first 500 points on the list.

Date and time settings

To configure the date and time settings and basic display settings select **System** from the Home Menu. Then select **Display**.

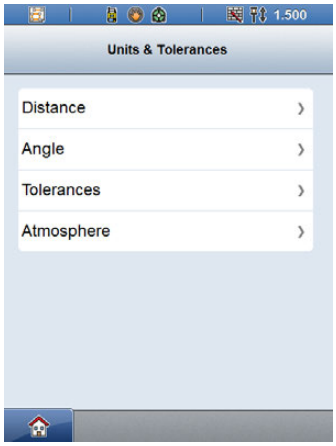


Element	Options	Description
Time format	**24 Hours**, **12 Hours**	Selected format will be adopted throughout the application.
Date format	**DD.MM.YYYY**, MM.DD.YYYY, **YYYY.MM.DD**	Selected format will be adopted throughout the application.
Coordinate Order	**E, N, H** **N, E, H**	Selected format will be adopted throughout the application.
Mode	**Simple**, **Standard**, **Precise**	Defines the decimal place: **Simple**: 0.12 **Standard**: 0.123 **Precise**: 0.1234 Selected format will be adopted throughout the application.

Units settings

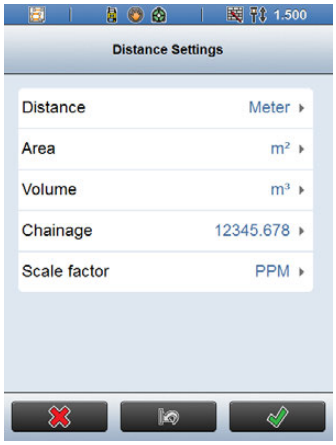
To configure the units settings for **Distance** and **Angle** select **Units**

from the Home Menu.



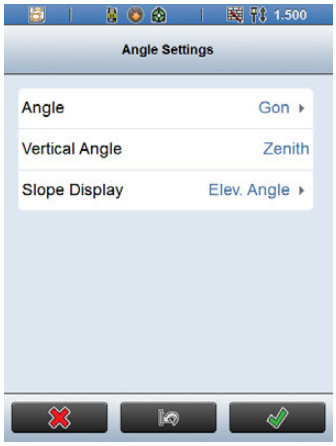
- Select **Distance**.
  - For **Distance** select from **Meter**, **US Survey Feet Fractional**, **US Survey Feet Decimal**, **Feet Fractional**, or **Feet Decimals**.
  - For **Area** select from **m²**, **Hectare**, **US ft²**, **US Acres**, **Int ft²**, or **Int Acres**.
  - For **Volume** select from **m³**, **Int ft³**, **US ft³**, or **yd³**.
  - For **Chainage** select one of the predefined settings.
  - For **Scale factor** select between **PPM** and **mm/km**.

  Tap to save changes.



- Select **Angle**.
  - For **Angle** select from **Gon**, **Deg Min Sec**, or **Deg Dec**.
  - For **Vertical Angle** the sole setting is **Zenith**.
  - For **Slope Display** select from **H:V**, **V:H**, **%**, or **Elev. Angle**.

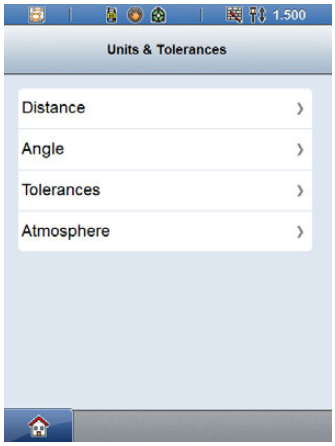
  Tap to save changes.

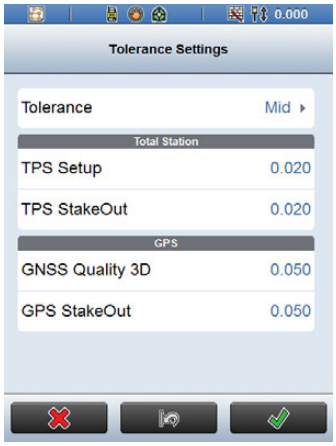


Tolerance settings

Tolerance settings can be altered in **Units** . Select **Tolerances**. In the **Tolerance Settings** screen, define the **Tolerance** level. Select from **Low**, **Mid**, or **High**.

Tap to save changes.





Adopted tolerance values differ according to the connected instrument, and the active application:

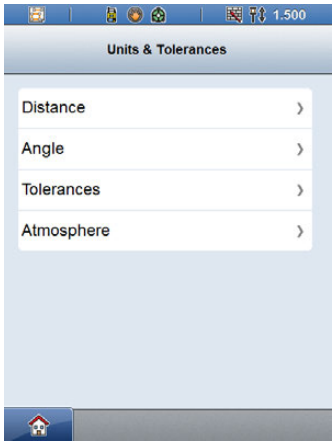
Tolerance level	GPS	Total Station Setup	Total Station Stake Out
Low	0.025 m	0.005 m	0.01 m
Mid	0.05 m	0.02 m	0.02 m
High	0.1 m	0.05 m	0.1 m

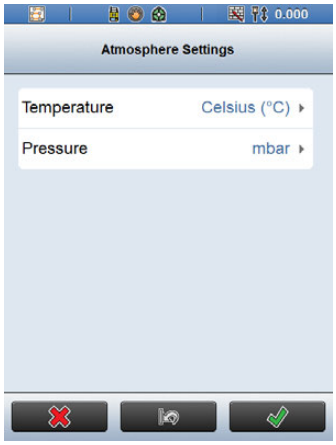
Atmospheric unit settings

Atmospheric unit settings can be altered in **Units** . Select **Atmosphere**. In the **Atmosphere Settings** screen, set the units for **Temperature** and **Pressure**.

- For **Temperature** select between **Celsius (°C)** and **Fahrenheit (°F)**.
- For **Pressure** select from **mbar**, **mmHg** and **inHg**.

Tap to save changes.

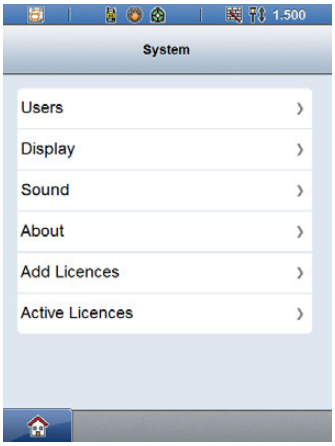


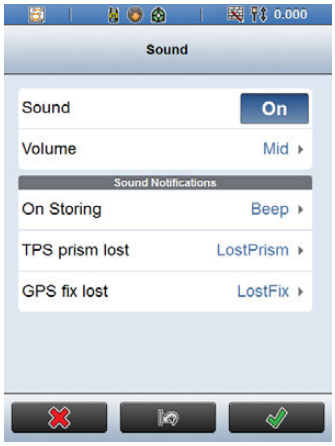


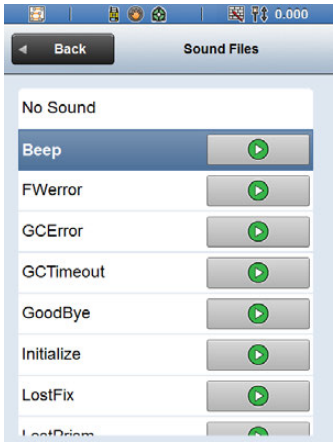
Sound notification

To configure the sound notification settings select **System** from the Home Menu. Then select **Sound**. In the Sound Settings screen:

- Switch sound on and off.
- Select Sound **Volume** level from **Low**, **Mid**, or **High**.
- For **On Storing**, **TPS prism lost**, and **GPS fix lost** select sound file for notification. Tap to listen to the relevant demo sound.
- Tap to save changes.

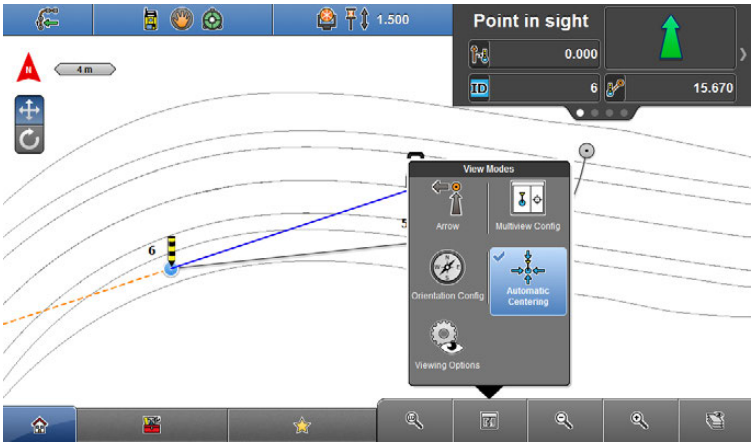




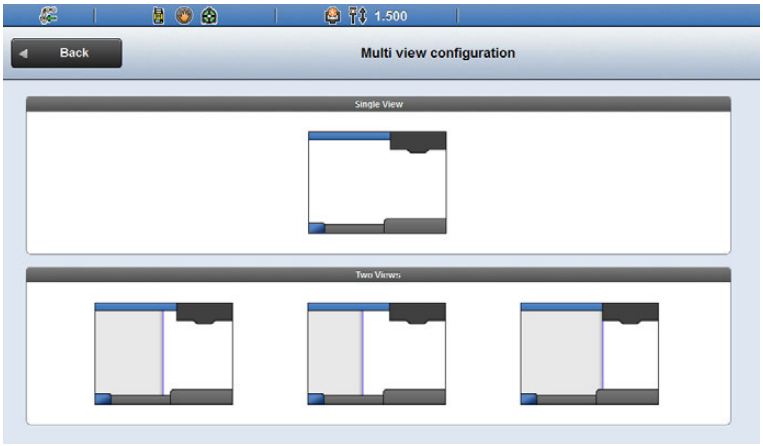


Multiview

In 7“ display mode, **Multiview Config**uration is available in **View Modes** in the **Map handler**.



In the **Multi view configuration** screen, select the required View. The Map screen is then divided into separate screens.
To change the **active section**, tap in the relevant section. The Map handler zoom controls are effective in the active section.



Available applications

The following applications are available within iCON site:

- **Setup**
  Determine Total Station instrument orientation and station coordinates using Total Station measurements.
  Refer to "4 How to Setup a Total Station" for more information.
- **Base Setup**
  Establish a Base station to transmit position corrections to a rover.
  Refer to "5 How to Setup a GPS Base Station" for more information.
- **Coordinate System**
  Create a coordinate system for GPS measurements.
  Refer to "6 How to Create a New Coordinate System" for more information.
- **Measure**
  Collect and display point and line information using the connected instrument.
  Refer to "7 How to Measure and Record Data" for more information.
- **Checks**
  Select or measure points or lines to check geometries.
  Refer to "8 How to Do Checks" for more information.
- **Draw**
  Draw and display points, lines and arcs without a connected instrument.
  Refer to "9 How to Sketch a Plan" for more information.
- **Stakeout**
  Place marks in the field at predetermined points.
  Refer to "10 How to Stake Out" for more information.
- **Cut & Fill**
  The heights of measured points are compared against the heights of a Terrain Model.
  Refer to "11 How to Stake Out Surfaces" for more information.
- **Roading**
  Place marks in the field along predetermined road lines and cross-sections.
  Refer to "12 How to Stake Out Roads" for more information.
  Roading is an optional application. Ask your agency or your Leica Geosystems representative for information about licensing.
- **Volumes**
  Allows surfaces to be measured and volumes to be calculated from these surfaces.
  Refer to "13 How to Handle Volumes" for more information.
- **Slopes**
  Allows to do checks on a defined slope, to find the Daylight line or the Daylight point, and to stake and mount the batter board.
  Refer to "14 How to Handle Slopes" for more information.
  Slopes is an optional application. Ask your agency or your Leica Geosystems representative for information about licensing.

- **MC Calibration**

  Perform a simple and quick workflow for a Machine calibration.

  Refer to "15 How to Use Machine Calibration" for more information.
- **Telematics**

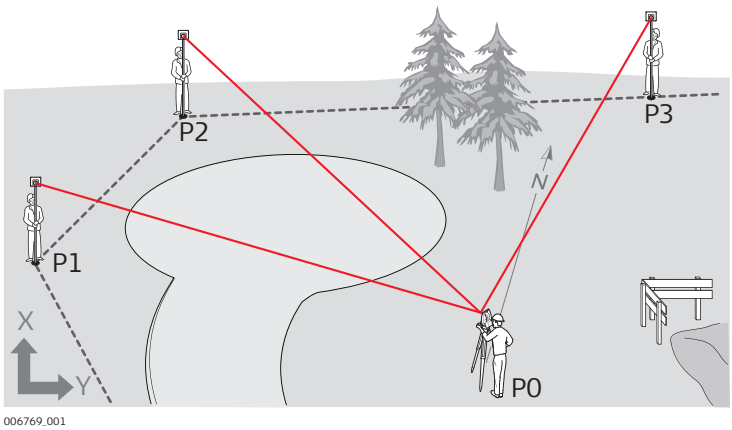
  With a connection between the controller and the iCON telematics web page, this tool offers:
  - a remote user to access the controller to view or control iCON site.
  - to exchange data between the controller and a remote web page.
  - a remote user to track the current position of the sensor.

  Refer to "17 How to Use Telematics" for more information.

  To use this functionality an account is needed for the iCON telematics web page. The license is handled on the controller. Ask your agency or your Leica Geosystems representative for information about licensing and how to get an account.

☞ The following chapters explain how to use the different application programs.

General description

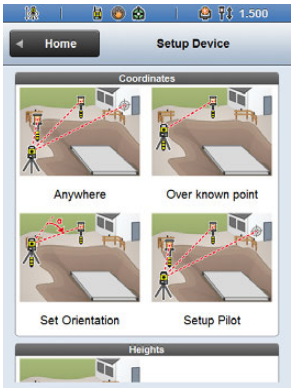
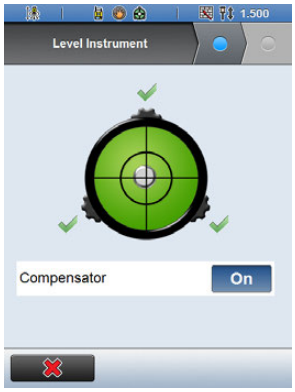


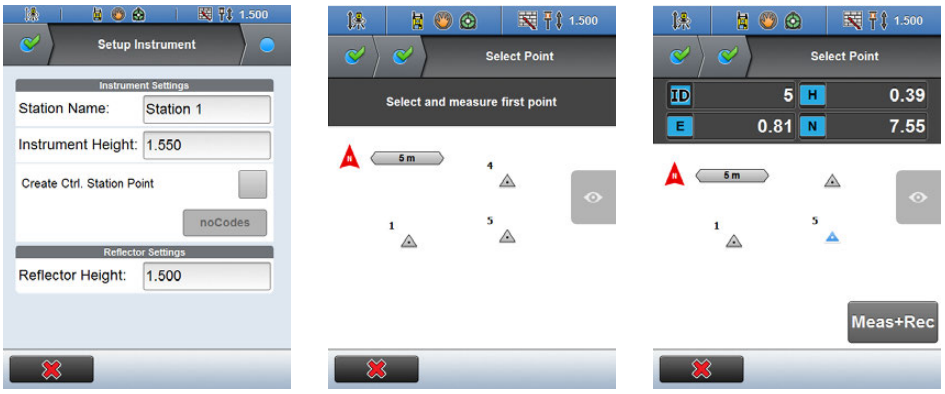
P0 Station (sought)
P1... Known points

Given:

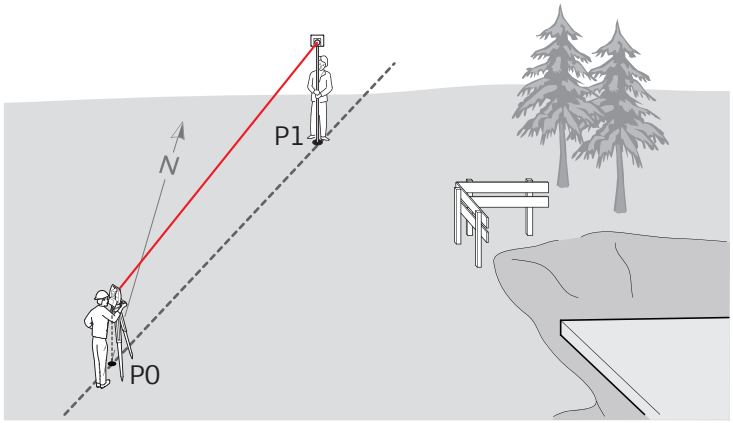
- Control points are active within the current job. Refer to "Importing data to the project step-by-step".
- Instrument positioned anywhere on site.

Setup anywhere with given coordinates step-by-step

Step	Description
1.	Select **Setup** from the Home Menu. Select **Anywhere**. Level instrument, then tap the next Wizard step to proceed.  

Step	Description
2.	Enter **Station Name**, **Instrument Height**, and **Reflector Height**. The **Create Ctrl. Station Point** tick box allows to define the station as control station point. In that case it's also possible to assign a code to that station point. Proceed to the next step, where the Map screen is displayed. Tap a point to select it as the first point to measure. Aim telescope to target point, then press **Measure**, then **Store**, or press **Meas+Rec**, if configured. Repeat for a second point. 
3.	If the station is within tolerance, tap ✓ to accept. To measure further points, tap the relevant point, then **Measure** and **Store**. When more than two points have been measured, the **Residuals** screen can be accessed by tapping ★, where inaccurate measurements can be removed. Tap ✓ to accept station position.

General description

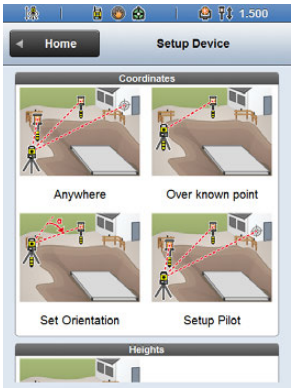
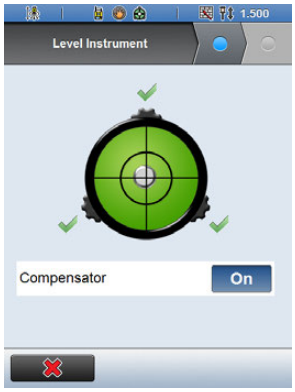


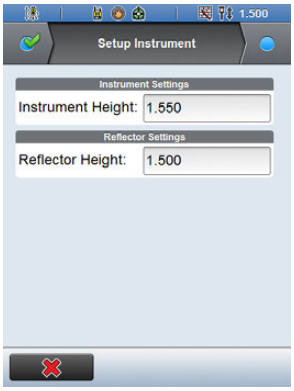
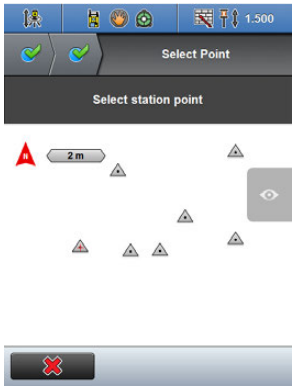
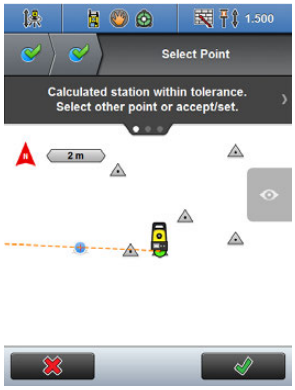
P0 Station (sought)
P1 Known point

Given:

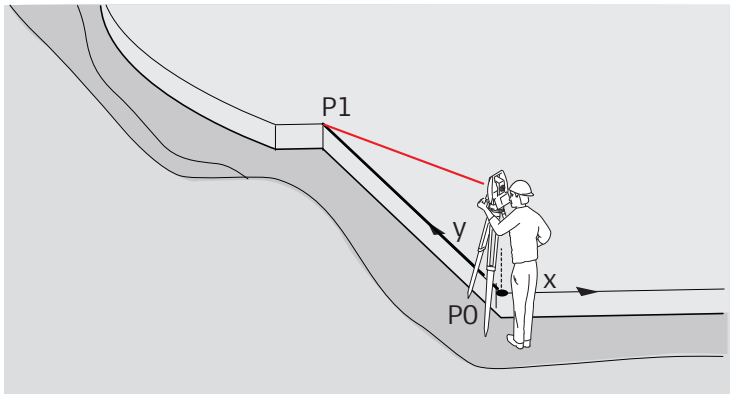
- Control points are active within the current job. Refer to "Importing data to the project step-by-step".
- Instrument positioned over a known point.

Setup over one known point with second known point step-by-step

Step	Description
1.	Select **Setup** from the Home Menu. Select **Over known point**. Level instrument, then tap the next Wizard step to proceed.  

Step	Description
2.	Enter **Instrument Height** and **Reflector Height**. Proceed to the next step, where the Map screen is displayed. Select the **Station Point**, and select a **Target Point**. Aim telescope to target point, then press **Measure**, then **Store**. If the station is within tolerance, tap to accept. If out of tolerance, re-measure to the target point, or to a new target point.   

General description



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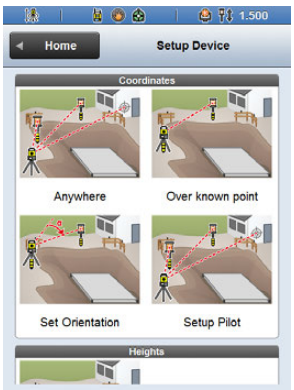
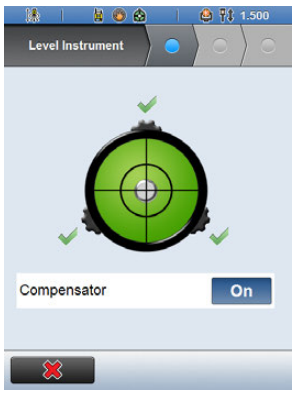
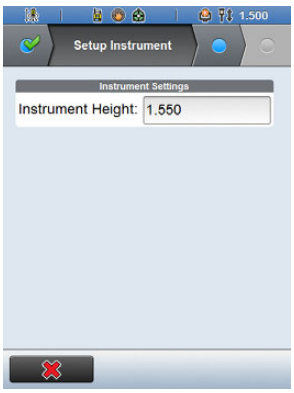
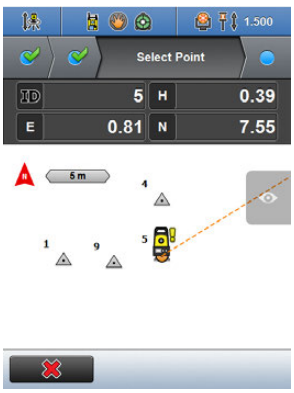
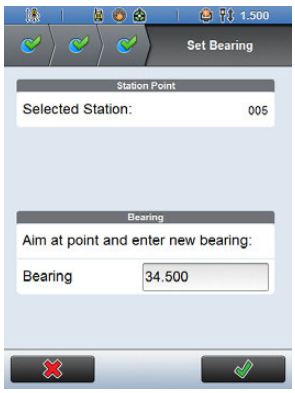
P0 Station
P1 Direction point

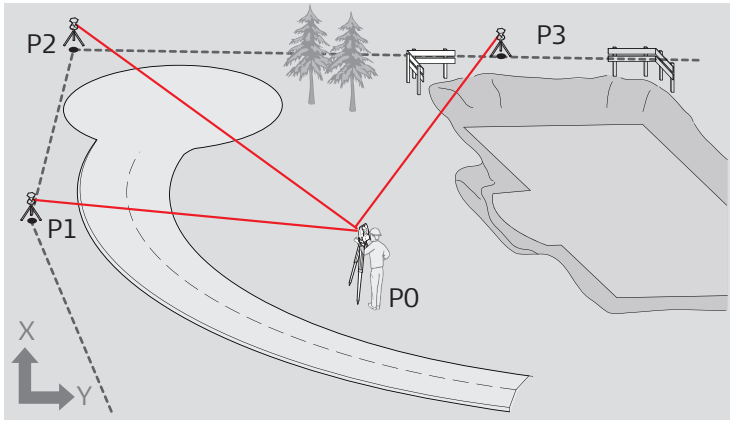
Given:

- Control points are active within the current job. Refer to "Importing data to the project step-by-step".
- Instrument setup over a known point.

Set station orientation step-by-step

Step	Description
1.	Select **Setup** from the Home Menu. Select **Set Orientation**. Level instrument, then tap the next Wizard step to proceed.  
2.	Enter **Instrument Height**, then proceed to the next Wizard step. Select **Station Point**, and tap the next Wizard step. Aim telescope in the required direction, and enter a **Bearing**. Tap to accept.   

General description



007082_001

P0 Station (sought)
P1... Known points, with prism

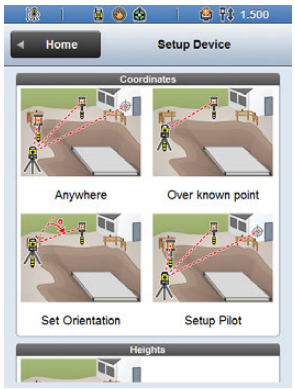
Given:

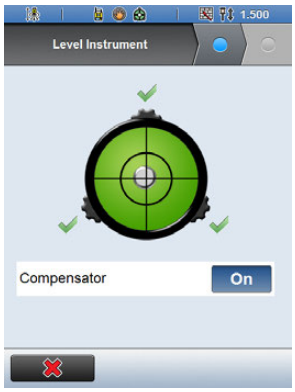
- Control points are active within the current job. Refer to "Importing data to the project step-by-step".
- At least three control points with prism available on site. Prism type and prism height set for each of these control points using Point List functionality.
- Instrument positioned anywhere on site.

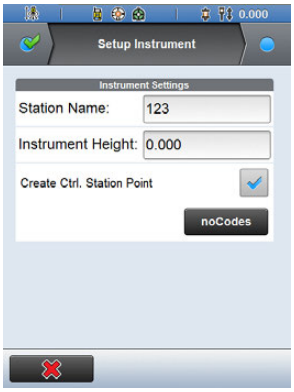
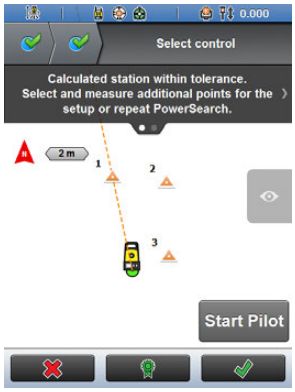
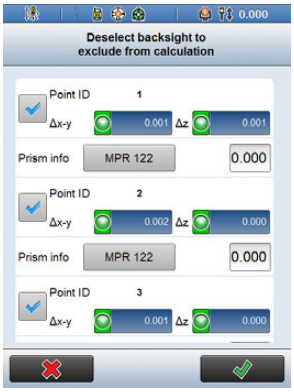
Setup Pilot can only be used with a iCON robot 60 Total Station and the according license.

Setup using Setup Pilot step-by-step

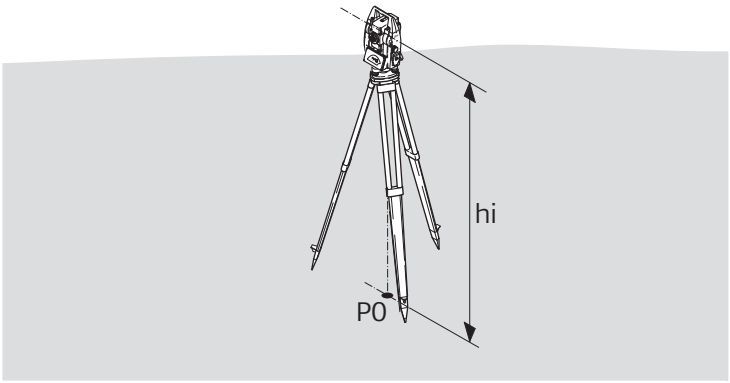
Step	Description
	When using **Setup Pilot** it's not necessary to select points on the screen but simply measure three control points in the field. The position of the station is automatically calculated.
1.	Select **Setup** from the Home Menu. Select **Setup Pilot**. Level instrument, then tap the next Wizard step to proceed.





Step	Description
2.	Enter **Station Name** and **Instrument Height**. The **Create Ctrl. Station Point** tick box allows to define the station as control station point. In that case it's also possible to assign a code to that station point. Proceed to the next Wizard step. Select first control point, and tap **Start Pilot**. The instrument starts a PowerSearch. When the calculated station is within tolerance a corresponding information is displayed. Tap to accept station position.  
3.	It is possible to **Pause** the search at any stage. Tap **Continue** to proceed. When at least three points have been measured and calculated, the **Residuals** screen can be accessed by tapping , where inaccurate measurements can be removed. Tap to accept. 

General description



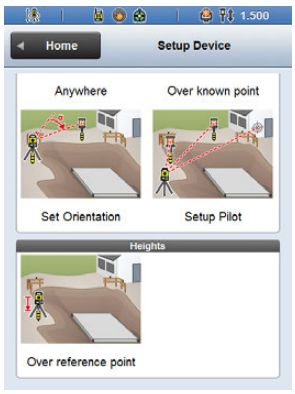
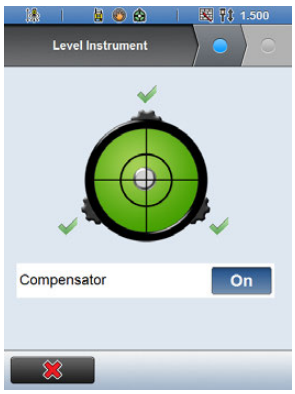
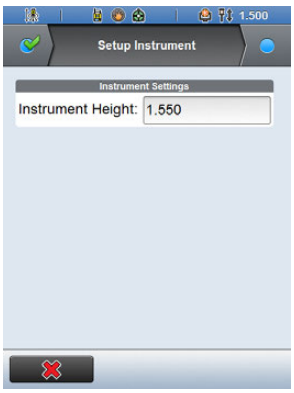
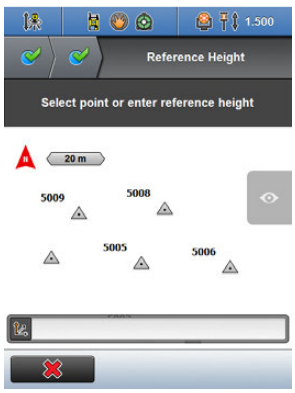
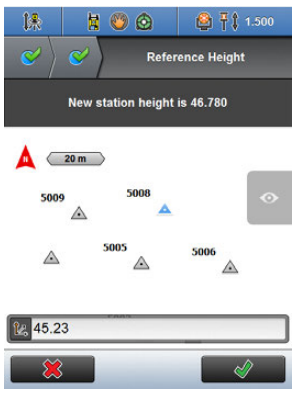
006788_001

hi Instrument height
P0 Benchmark

Given:

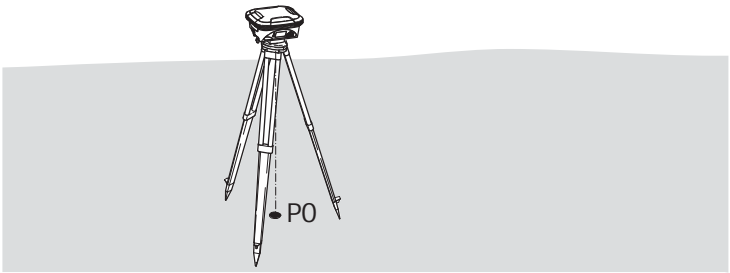
- Instrument placed over benchmark with given elevation.

Transfer elevation to instrument placed over height benchmark step-by-step

Step	Description
1.	Select **Setup** from the Home Menu. Select **Over reference point**. Level instrument, then tap the next Wizard step to proceed.  
2.	Enter **Instrument Height**. In the next Wizard step, either select the relevant point from the map, or directly enter the height of the benchmark. Tap to confirm. The new station height is set.   

General description

☞ iCON gps 60 requires a license to use this application.



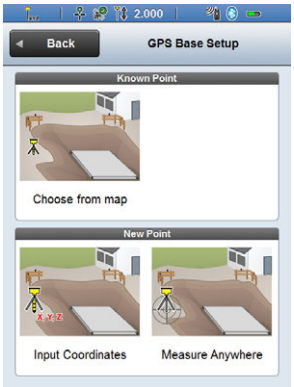
006772_001

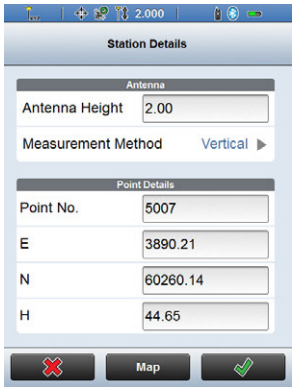
P0 Known point

Given:

- Control points in the chosen coordinate system are active within the current job. Refer to "Importing data to the project step-by-step".
- Instrument is setup with a Base profile. Refer to "1.5.2 GPS Profile Setup".
- A coordinate system is loaded to the project. Refer to "Importing data to the project step-by-step".
- Coordinates must be available in WGS84.

GPS Base Station setup over known point step-by-step

Step	Description
1.	Select **Base Setup** from the Home Menu. Select **Known Point** - **Choose from map**. Tap a point in the Map screen. Alternatively, tap **Get Nearest** to display the closest points to the current antenna position. If there is only one point available, it is automatically selected. 

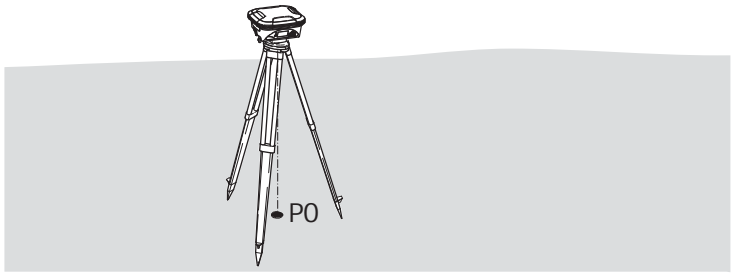
Step	Description
2.	When the required point is selected, tap ✓ to accept. The **Station Details** can then be reviewed and edited. Once ✓ is pressed, the GPS Base Station starts transmitting corrections. 

5.2 GPS Base Station Setup over New Point

GPS

General description

☞ iCON gps 60 requires a license to use this application.



006772_001

P0 Station (sought)

Given:

- Instrument is setup with a Base profile. Refer to "1.5.2 GPS Profile Setup".
- A coordinate system is loaded to the project. Refer to "Importing data to the project step-by-step".

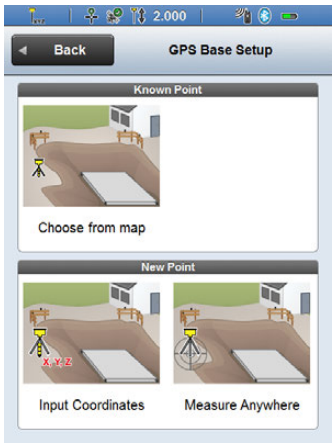
☞ Two possibilities available: **Input Coordinates** or **Measure Anywhere**.

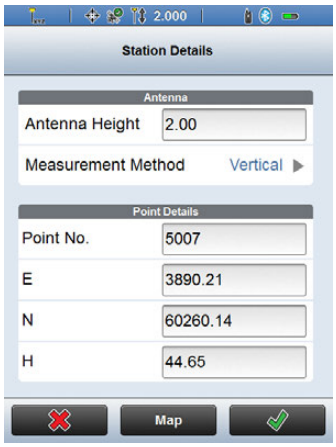
GPS Base Station setup over new point

- **Input Coordinates:**

Select **Base Setup** from the Home Menu. Select **New Point** - **Input Coordinates**.

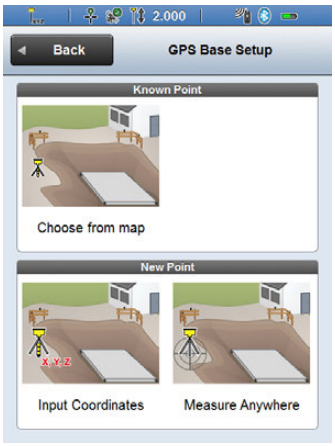
Enter the antenna and point information in the **Station Details** screen, tap to accept. Once is pressed, the GPS Base starts transmitting corrections.

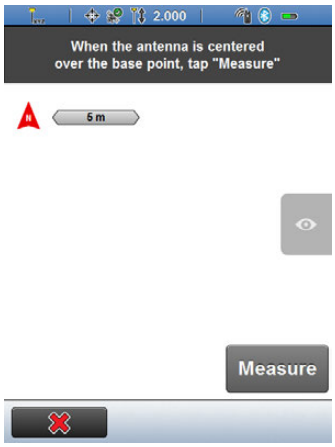


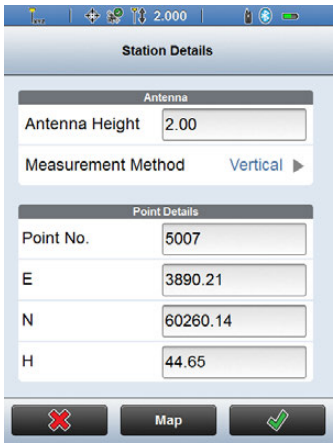


- **Or alternatively, Measure Anywhere:**

From the **GPS Base Setup** Menu, select **New Point** - **Measure Anywhere**. Centre the antenna over the base point, and tap **Measure**. The **Station Details** screen is displayed. Check the information, and tap to accept. Once is pressed, the GPS Base starts transmitting corrections.

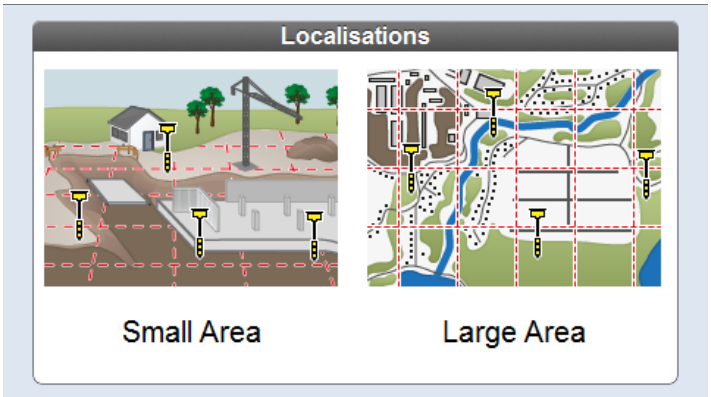






General description

Measure points with known coordinates to create a coordinate system for use in either a **Small Area** (< 10 km^2) or a **Large Area**.

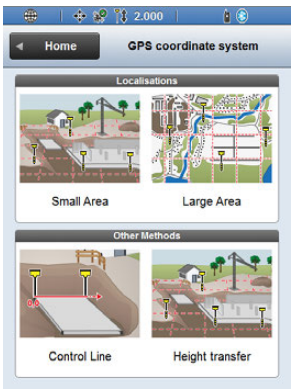


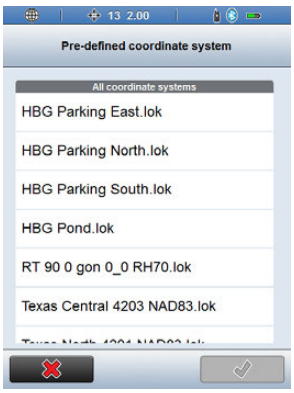
Given:

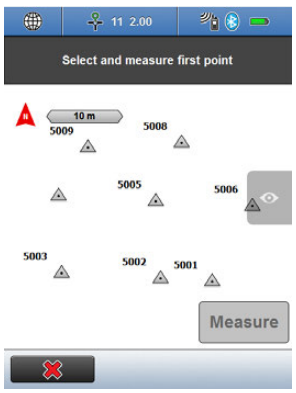
- Control points are active within the current job. Refer to "Importing data to the project step-by-step".
- Instrument is setup with a Rover profile and has a Fixed position. Refer to "1.5.2 GPS Profile Setup".

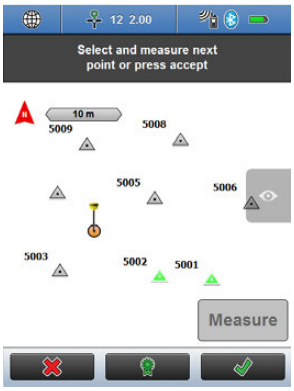
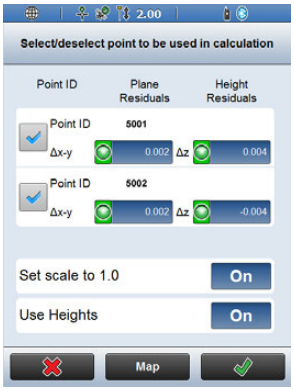
Create a new Coordinate System step-by-step

Step	Description
1.	Select **Coordinate System** from the Home Menu, then from the **GPS coordinate system** Menu, select **Small Area** or **Large Area**. The workflow is the same, except that for **Large Area** a predefined coordinate system must be selected (see 2nd screen). The Map screen is then displayed. In the Map screen, select the first point, then press **Measure**. Repeat for further points.





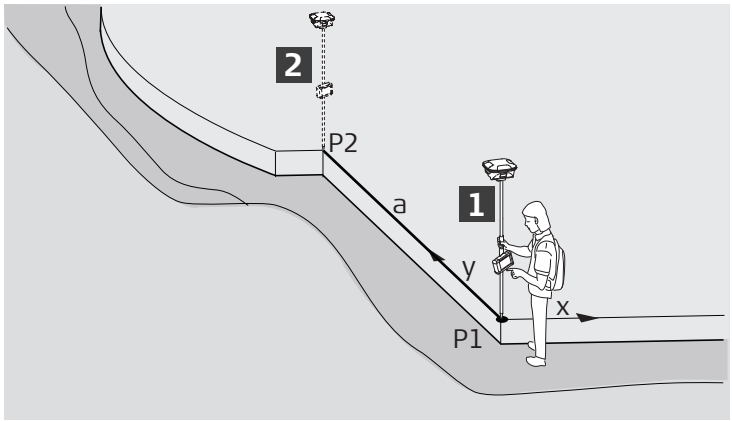


Step	Description
2.	Tap in the Map screen to view Residuals for each measured point. Inaccurate measurements can be removed. Heights can be turned **On** and **Off**. For a **Small Area** the scale can also be set/locked to 1.000. Tap **Map** to return to the Map screen. Tap to save changes and create the Coordinate System.  
	It is possible to cancel and store an unfinished localisation. In this case the unfinished localisation can be resumed the next time the **GPS coordinate system** application is started.

6.2 How To Define a Control Line using GPS

GPS

General description



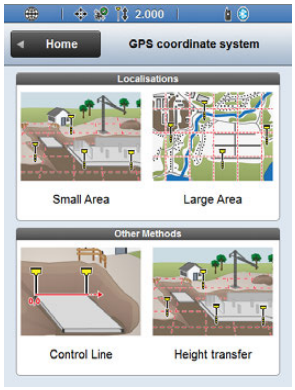
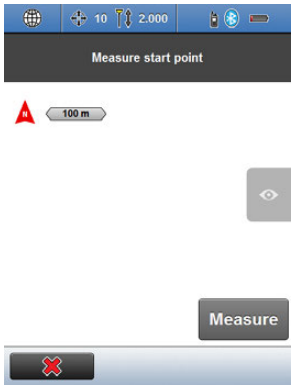
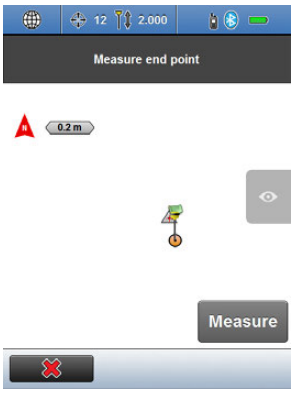
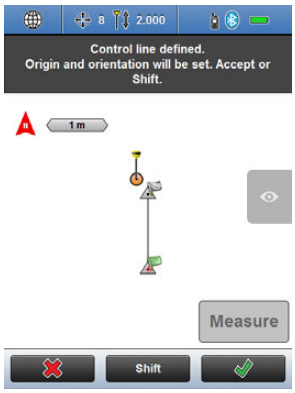
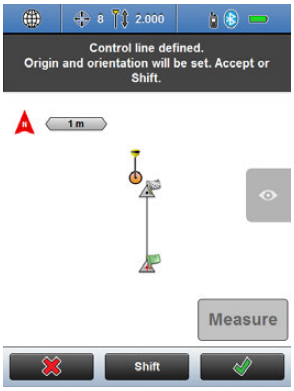
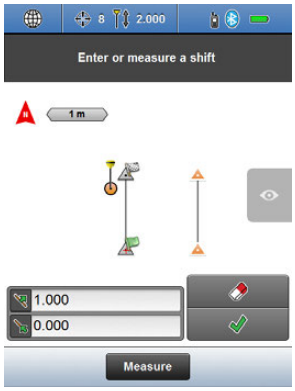
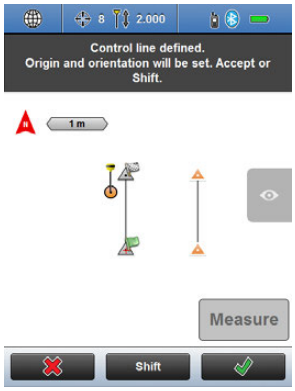
006791_001

P1	Start point
P2	Direction point
a	Control line (sought)

Given:

- Instrument is setup with a Rover profile and has a Fixed position. Refer to "1.5.2 GPS Profile Setup".

How to define a control line using GPS step-by-step

Step	Description
1.	Select **Coordinate System** from the Home Menu, then from the **GPS coordinate system** Menu, select **Control Line**. Position the antenna, and press **Measure** to record the first point.  
2.	Move antenna to second point of the control line. Press **Measure**. The control line is now defined. Tap to confirm.  
3.	To Shift the origin of the control line, press **Shift**. Enter shift values in the Toolbar. To measure a Shift, press **Measure**. Position the antenna, and press **Measure**. The origin of the control line is shifted to the new point. Tap to confirm the shift.   

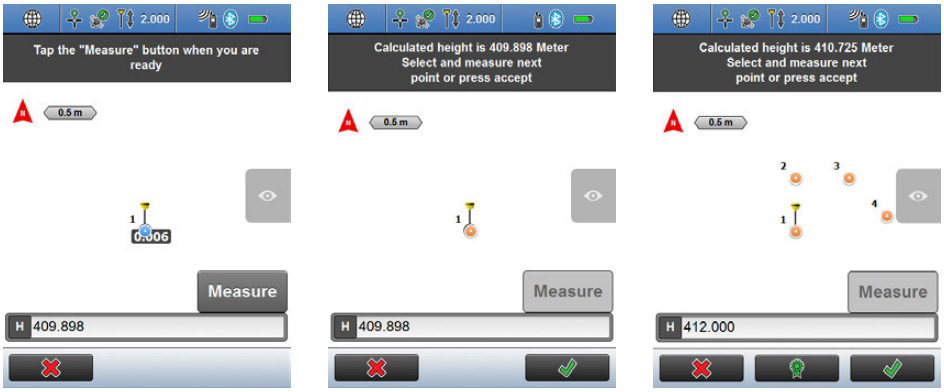
General description

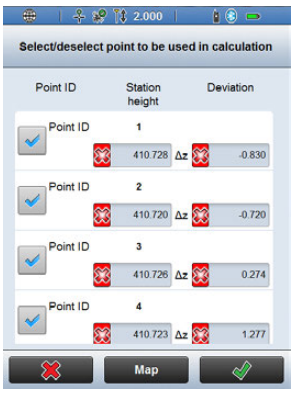
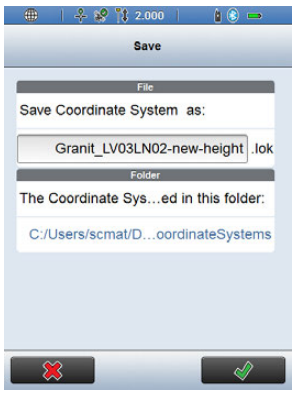
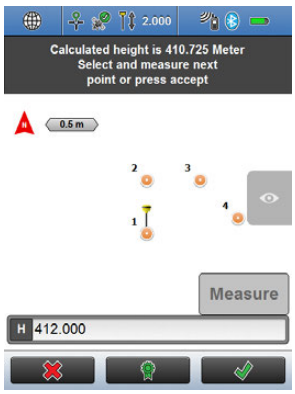
Given:

- Instrument is setup with a Rover profile and has a Fixed position. Refer to "1.5.2 GPS Profile Setup".

☞ **Height transfer** enables to simply define a **local height system** and consider the local height to all points measured afterwards.

GPS height transfer step-by-step

Step	Description
1.	Select **Coordinate System** from the Home Menu, then from the **GPS coordinate system** Menu, select **Height transfer**. Select a coordinate system, either from the project or a pre-defined one. Tap to accept.
2.	Select an existing point, either from the map or the Point List, to get the height from or input height value directly. Tap to accept the local reference height or measure further points. 

Step	Description
3.	When more than two points have been measured, the **Residuals** screen can be accessed by tapping , where inaccurate measurements can be removed. To finish the localisation tap **OK** in the **Confirmation** screen. Then save the new Coordinate System, either with the proposed name or a user defined one, by tapping . Confirm the next information screen. From now on all points measured will have the reference height applied.   
☞	When more than one point has been measured to define the local reference height, a **best fit** solution will be applied and used as the height difference. This means that the local reference height is balanced from the measured heights and the height difference equals the height of the newly measured point minus the local balanced reference height.

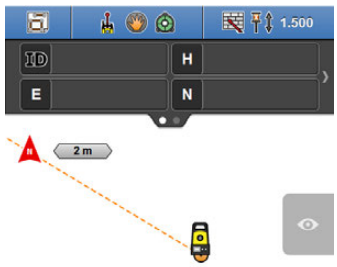
7 How to Measure and Record Data TPS + GPS

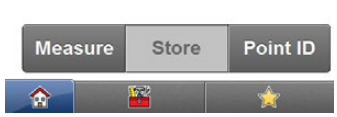
7.1 General Information TPS + GPS

General description

Measure is an application that records and displays point and line information obtained using the connected Total Station or GPS instrument.
Points, lines and arcs can be measured, recorded and displayed within the Map screen. Descriptions, codes, and IDs can be assigned to each element. All element information can later be exported to office software.

All measurements are performed using the **Measure bar**, which can be configured to display the commands you require. Refer to "Measure bar" for more information.

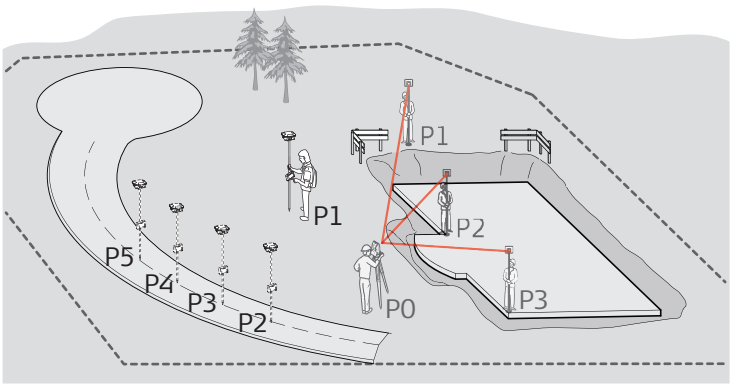


Measure bar 

Commands can also be placed in the Favourites key. Refer to "Measure bar" (Information about Favourites menu configuration) for more information.

7.2 Measuring and Recording Points, Lines and Curves TPS + GPS

General description



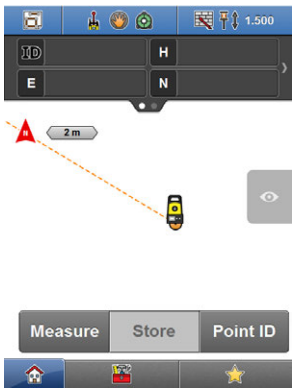
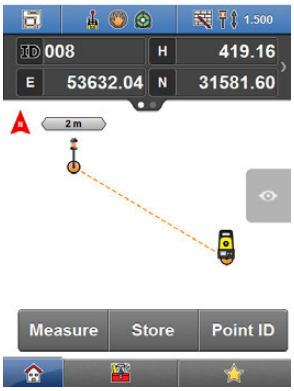
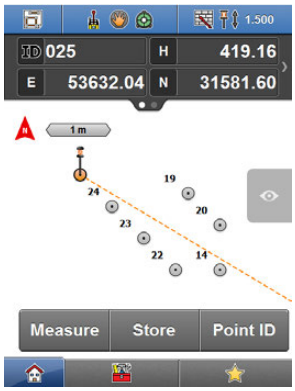
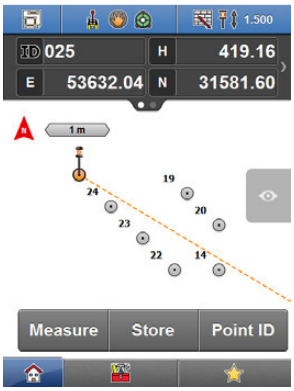
006773_002

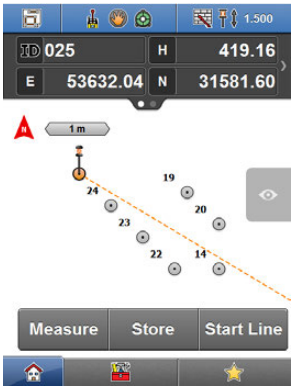
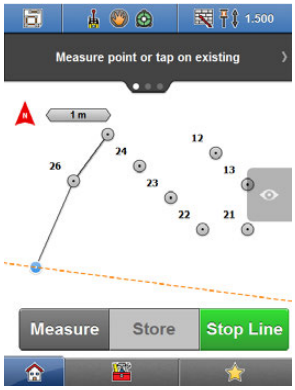
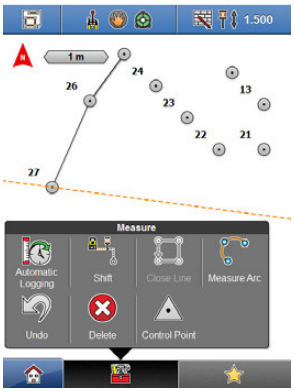
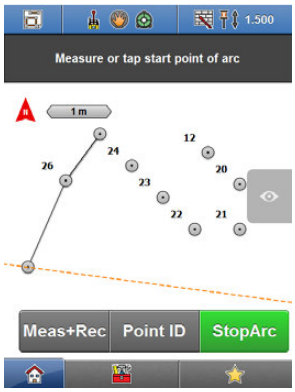
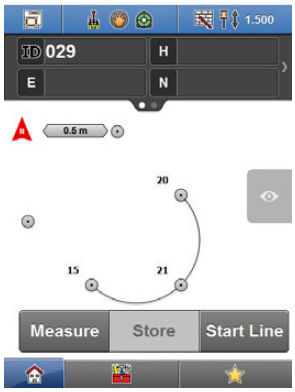
P0 Known station
P1... Target

Given:

- Instrument is connected and setup.

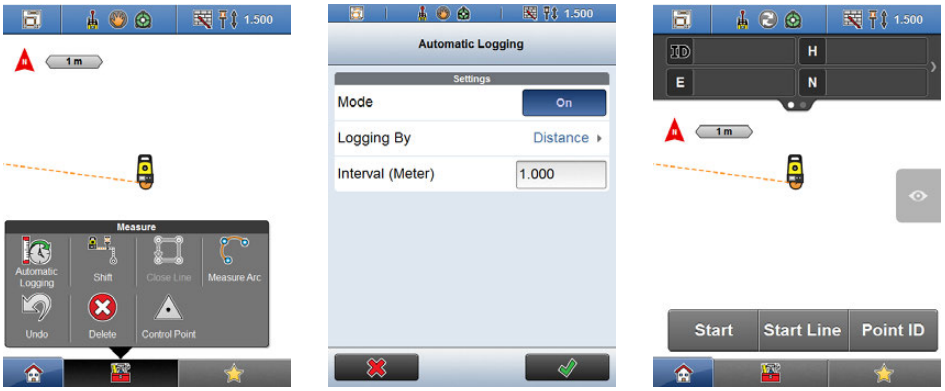
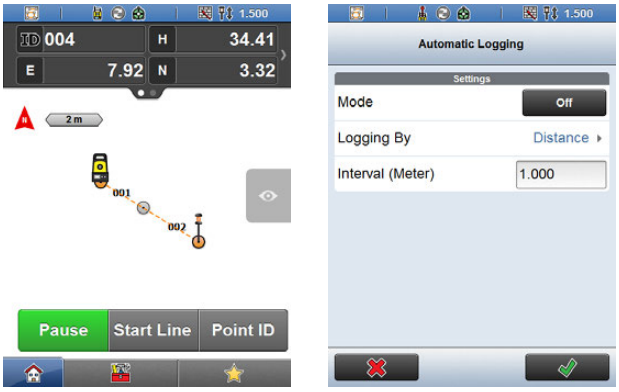
Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

Step	Description
1.	Select **Measure** from the Home Menu. Map screen is displayed. 
2.	Sight target and press **Measure**. After measuring, press **Store** to store the point. Measure and store as many points as required.  
3.	To create lines between points, **tap and hold** the Measure bar, and configure to display the **Start Line** function. Tap to accept. 

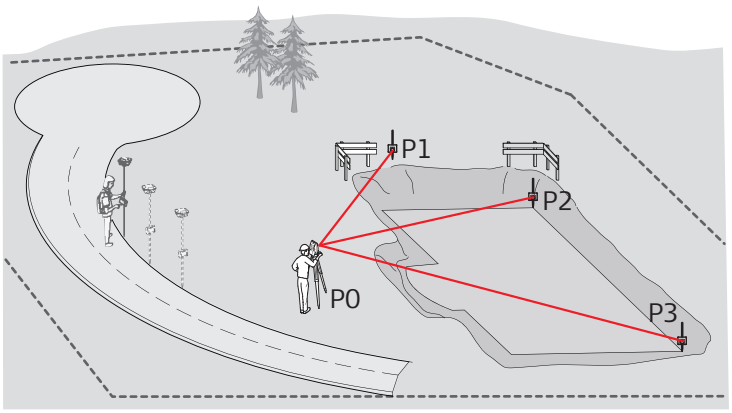
Step	Description
4.	Press **Start Line**. Measure and store points. A line is drawn between the points. To disable the line function, tap **Stop Line** in the Measure bar.  
5.	To create arcs from three points, select **Measure Arc** from the Toolbox. Measure and store three points. When the third point is stored, the arc is created.   
☞	To store points immediately after measuring, configure the Measure bar to contain the **Meas+Rec** key.
☞	Define **Measure Mode** in the Status 1 menu.
☞	It is also possible to use existing points to create lines and arcs.

This feature is available when using a Robotic Total Station or GPS instrument.

How to store points automatically step-by-step

Step	Description
1.	In **Measure**, select **Automatic Logging** from the Toolbox. In the **Automatic Logging** screen, set **Mode** to **On**. Select **Distance** or **Time** for the logging mode, and define the Interval. Tap ✓ to accept. Press **Start** in the Measure bar. 
2.	As the target position moves, points are automatically stored at the defined time/distance interval. Press **Pause** to temporarily stop storing points. To turn off automatic logging, set the mode to **Off** in the **Automatic Logging** screen. 

General description



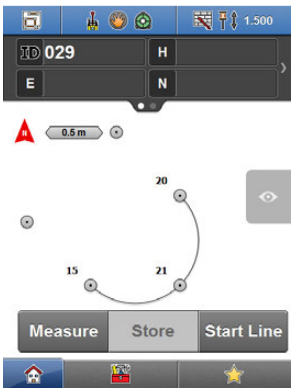
006774_001

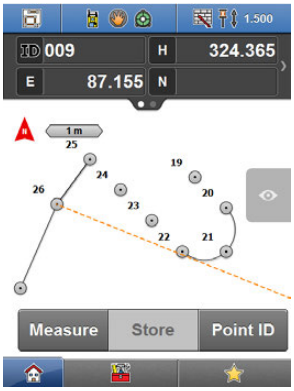
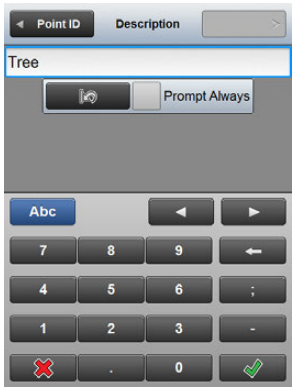
P0 Known station
P1... Target

Given:

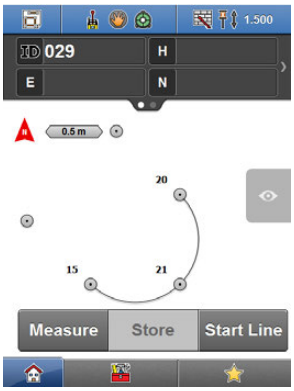
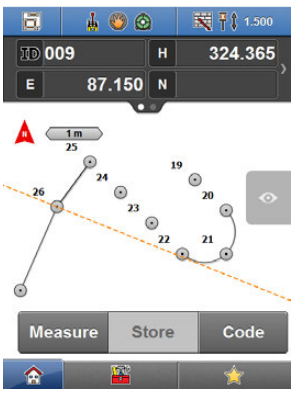
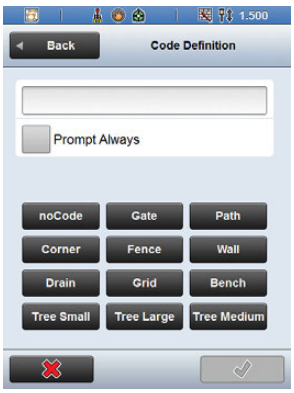
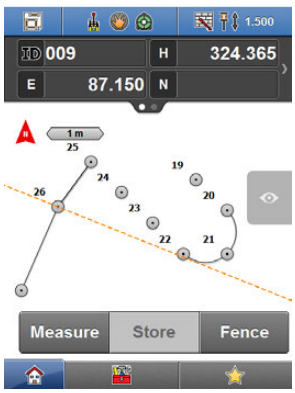
- Instrument is connected and setup.

Applying descriptions and point IDs to measurements step-by-step

Step	Description
1.	To enable the **Point ID** function, **tap and hold** the Measure bar, and configure to display **Point ID**. Tap ✓ to accept. 
☞	It is possible to add **Point ID** and other commands to the Favourites menu in the Navigation bar, by tapping and holding the specific key whilst in the **Measure bar configuration** screen.

Step	Description
2.	Tap **Point ID** to edit ID for the next point. Tap the **Description** arrow to enter a description. When finished, tap to accept. The next stored point will take the defined Point ID. Further Point IDs will follow-on numerically.  
☞	To automatically recall this function for every measured/stored point, tap the **Always Prompt** checkbox.

Defining code for each stored point step-by-step

Step	Description
1.	To define a code for specific points, configure the Measure bar to display **Code**. **Tap and hold** the Measure bar, select **Code** from the **Measure bar configuration** screen, and tap ✓ to accept. 
2.	Tap **Code** in the Measure bar. Select a predefined code from the list, or define a new code in the text entry field. New codes are stored in the code list. Tap ✓ when finished. The code key in the Measure bar displays the selected code. The selected code is assigned to any points that are stored. To change the active code, tap the **Code** key, and select a predefined code, or define a new code.   
☞	To automatically recall this function for every measured/stored point, tap the **Always Prompt** checkbox.
☞	Refer to "Importing data to the project step-by-step" for information about loading pre-defined Code Lists.

7.5 How to Shift Points

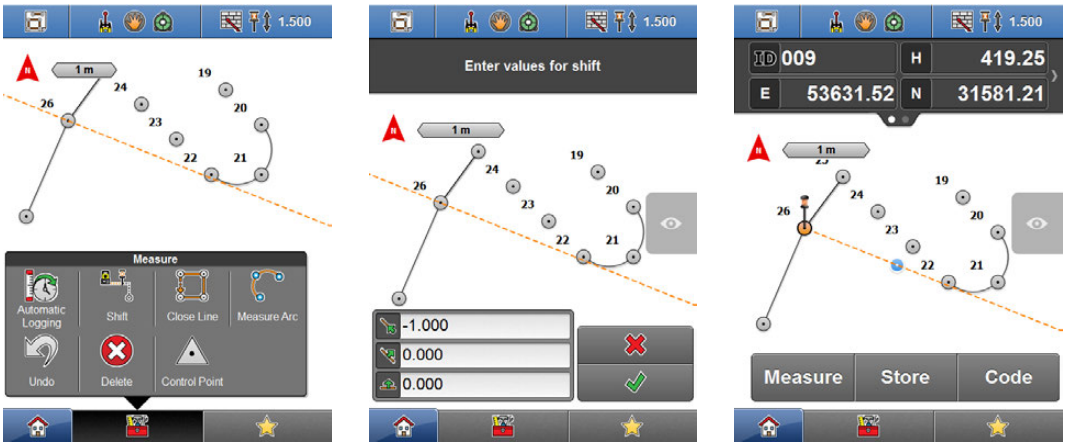
TPS + GPS

7.5.1 Shift Point

TPS + GPS

Description

It is possible to shift the position of a measured point in all three dimensions. Select **Shift** from the Toolbox, and enter the Shift values in the displayed Toolbar. Tap ✓ to accept. The next measured point has the defined shift applied to it.



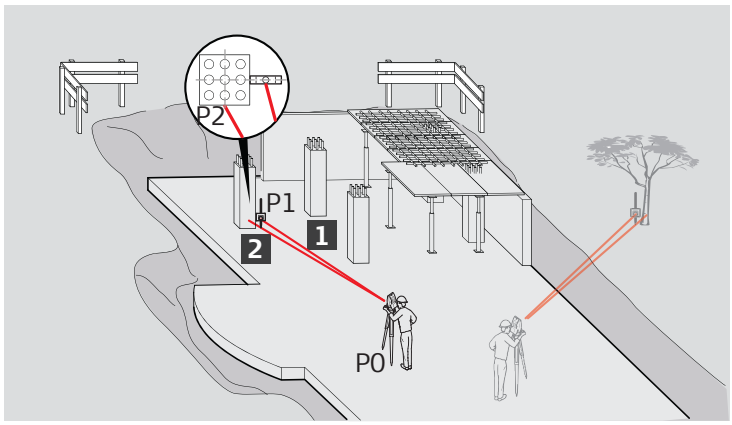
☞ These shift values will not be applied to further measured points.

☞ **TPS** only: Shift applies offsets in relation to the current Total Station orientation.

7.5.2 Measuring the Centre of Trees or Columns

TPS

General description



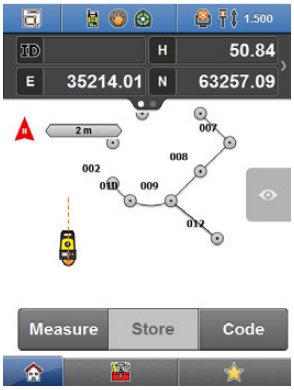
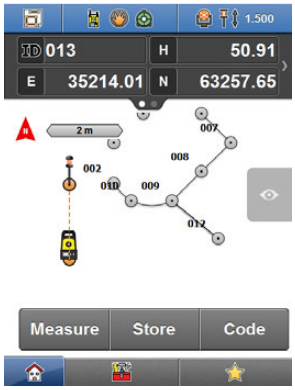
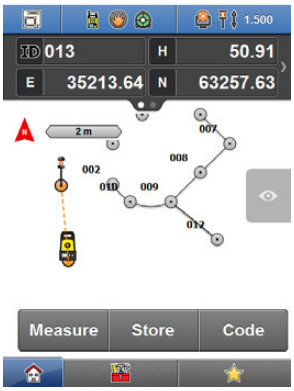
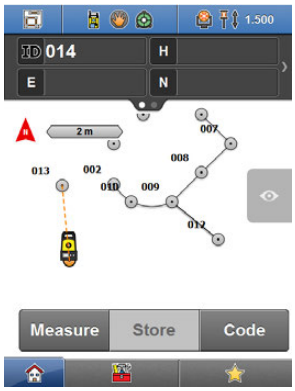
006775_001

P0 Known station
P1 Target
P2 Centre point

Given:

- Instrument is connected and setup.
- Map handler displays separate **Measure** and **Store** keys. **Tap and hold** Measure bar to configure accordingly.

Measuring the centre of trees or columns step-by-step

Step	Description
1.	Place prism next to tree or column, at the same distance as the centre, as shown in the illustration before. Sight prism and press **Measure**.  
2.	Turn instrument and sight the centre of the tree or column. Press **Store** to store the point with the new angle.  

8 How to Do Checks

General description

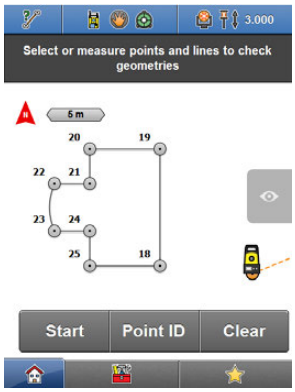
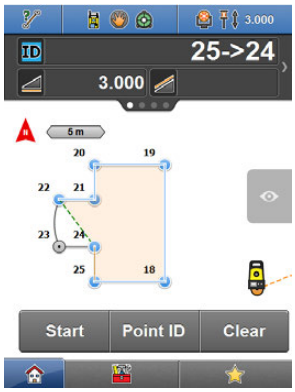
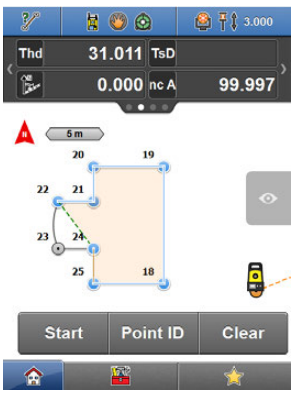
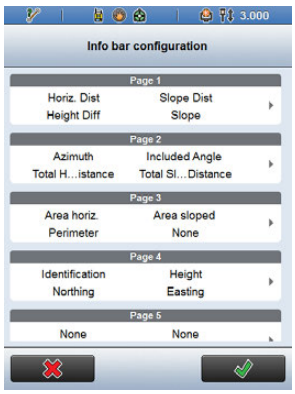
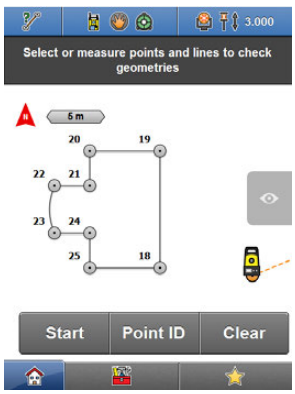
Checks is an application that can be used to check geometries by selecting or measuring points and lines.
Results are shown in the Information bar within the application.

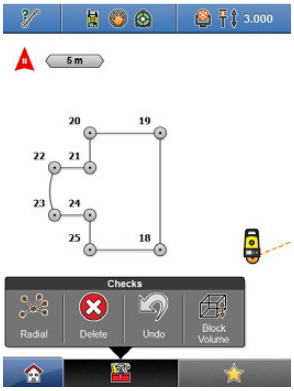
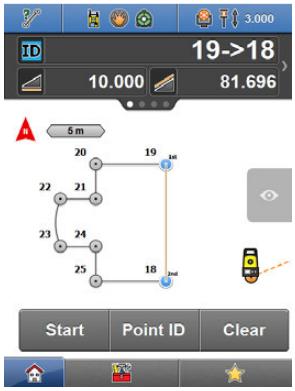
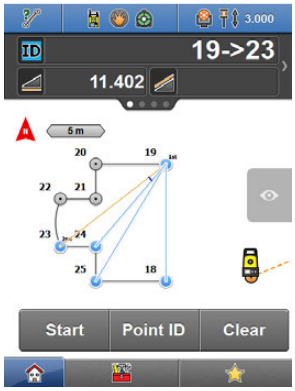
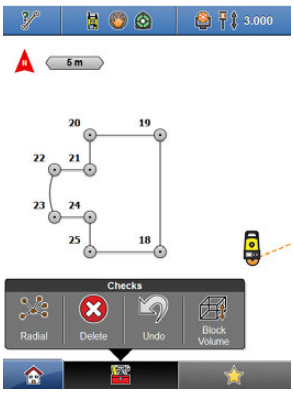
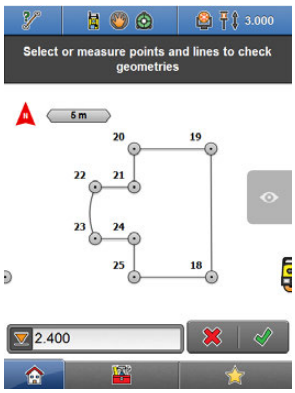
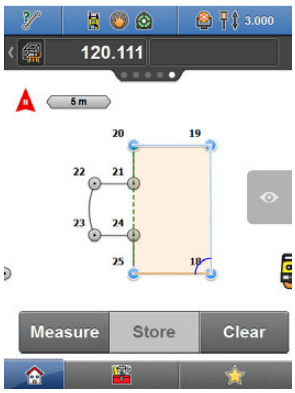
Calculated values are tie distance results, angles, areas and block volumes:

- Horizontal distance, sloped distance, height difference, slope
- Sum horizontal, sum sloped, azimuth, last included angle
- Area and perimeter in plane and tilted
- Block volume, plane and tilted

☞ Tilted area and perimeter allow also to calculate vertical geometries, for example the size of a window.

How to do checks step-by-step

Step	Description
1.	Select **Checks** from the Home Menu. Select or measure points and lines to check geometries. Current results are updated and shown in the Information bar according to the points and lines selected or measured.  
☞	The points and lines have to be selected or measured ordered, either in clockwise or anti-clockwise direction.
2.	To display further results tap the arrow in the Information bar. **Tap and hold** the Information bar to see which results are displayed or to configure the Information bar. Tap when finished. Tap **Clear** in the Measure bar to deselect the measured or selected points and lines.   

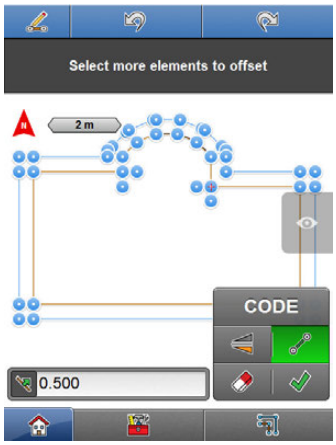
Step	Description
☞	All values are shown according to the current settings, in the chosen unit and the number of decimals set.
3.	To switch to a radial calculation method select **Radial** from the **Toolbox**. ☞ Radial method means, the first point selected or measured is always kept and is always the first point for the next tie distance. To switch back to the polygonal calculation method select **Polygonal** from the **Toolbox**. ☞ When switching between radial and polygonal method, the current result is adapted immediately.   
4.	For calculating block volumes select **Block Volume** from the **Toolbox**. Enter the needed height value, then tap ✓. Now select or measure points and lines. As soon as an area can be calculated, the block volume is also calculated and the result displayed in the Information bar, if configured accordingly. ☞ It is also possible to select or measure points and lines first and then select **Block Volume** from the **Toolbox**.   
☞	The **Delete** and **Undo** functions are also available in the **Toolbox**.

9 How to Sketch a Plan

General description

Draw is an application that can be used without a connected instrument. Layout plans consisting of **points**, **lines** and **arcs** can be created, and these plans can then be used in another application to be directly staked out.

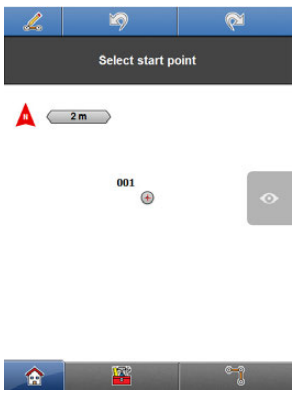
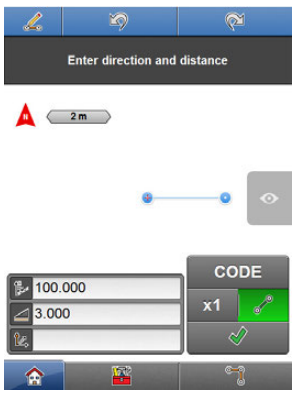
The following is a step-by-step guide to using some of the key functions in **Draw** to create a layout plan.

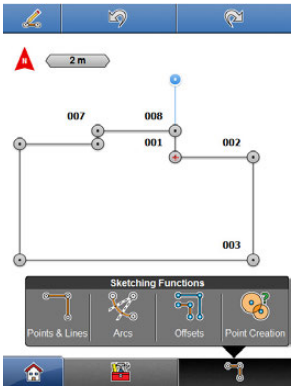
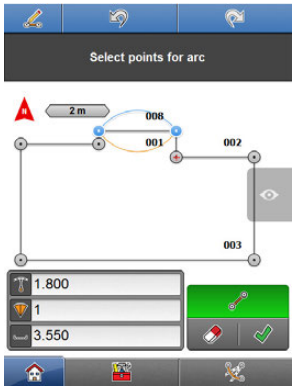
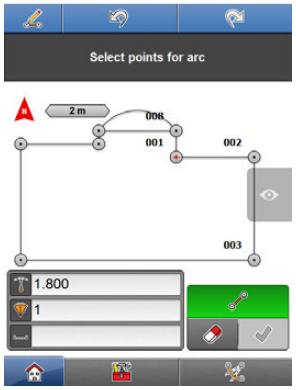
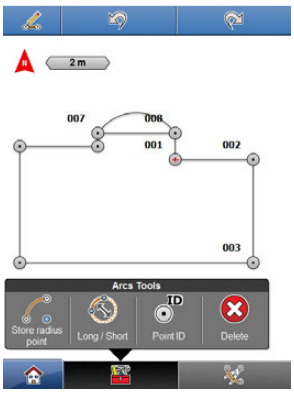
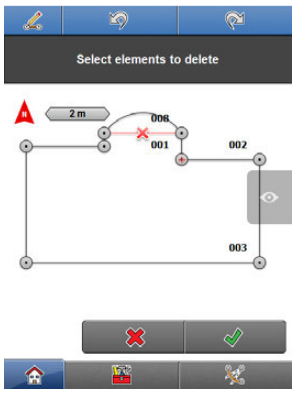
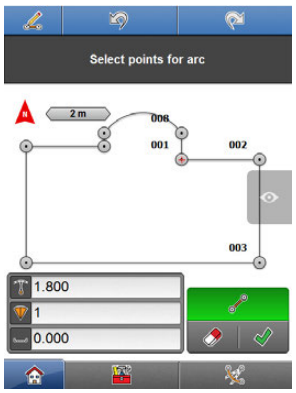


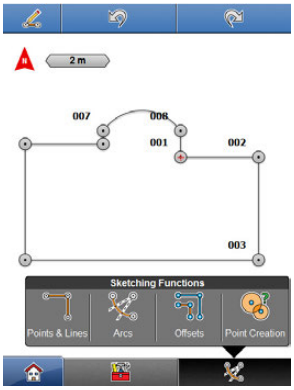
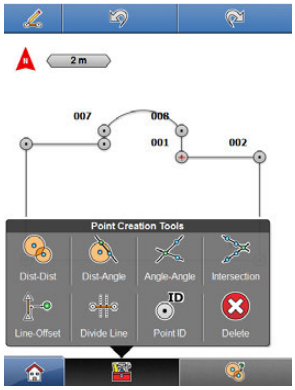
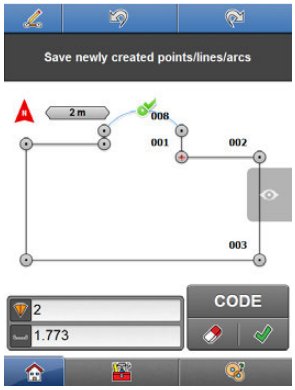
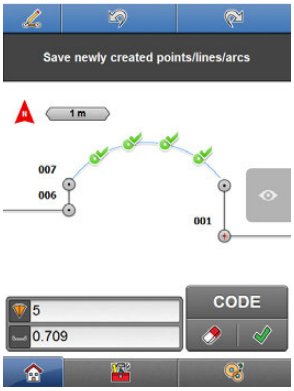
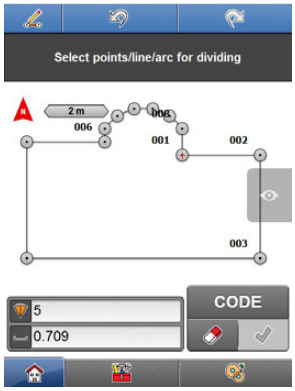
Example of a layout plan

☞ No instrument connection is required.

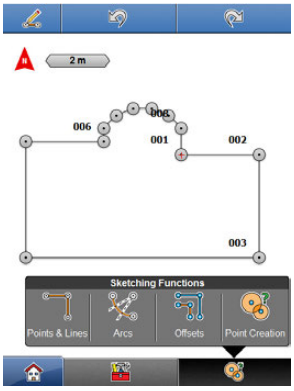
How to sketch a plan step-by-step

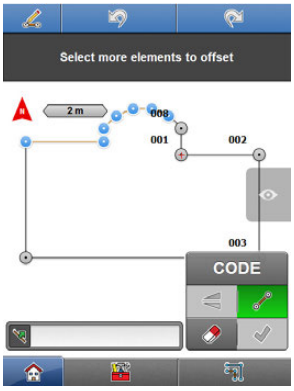
Step	Description
1.	Select **Draw** from the Home Menu. If point data is present, tap a point to begin. Use the Toolbar to enter information for the position of the next point. Toolbar contains options to edit **angle**, **distance**, **height**, **multiple points**, and to **draw a line** between points. Tap to confirm point position. The process can then repeat.  
☞	Use **CODE** to define and apply a code for every point recorded.

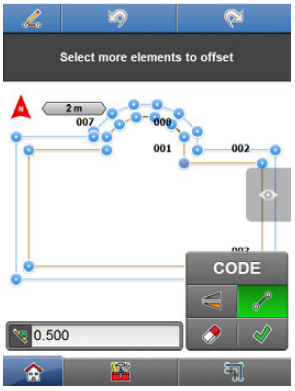
Step	Description
2.	To draw an arc, select **Arcs** from the **Sketching Functions** menu. Tap the points for the arc. Arcs can be drawn by tapping **two points** and inputting **radius** information into the Toolbar, or tapping **three points**. Tap to store the arc.   
3.	The **Delete** function is available in the **Toolbox**. Select the elements for deleting, then press .   

Step	Description
4.	To distribute a number of points evenly along an arc/line, select **Point Creation** from the **Sketching Functions** menu, and then from the Toolbox select **Divide Line**. Select the line you need to divide, then input the **Number of Segments**, or alternatively the **Interval length**. Tap to confirm.     

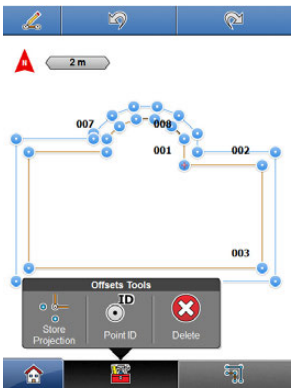
Step	Description
5.	To create offset points for the sketch, select **Offsets** from the **Sketching Functions** menu. Select the points required for offset, then enter an **Offset** value. Enable or disable **draw line** as required. Use **flip** to switch the offset value from positive to negative.

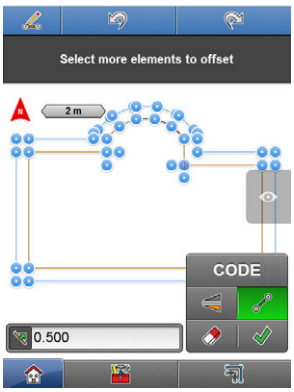






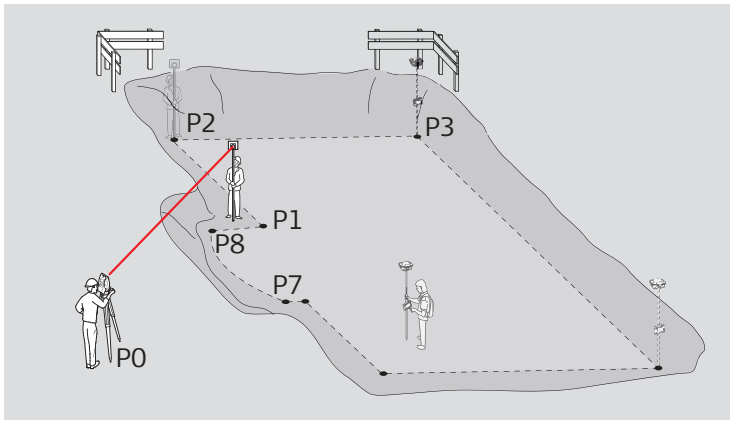
☞ **Store Projection**, which displays two points at each corner at perpendicular offsets, can be toggled **ON/OFF** by accessing the Toolbox. Tap to accept.





General description

The **Stakeout** application is used to place marks in the field at predetermined points. These predetermined points are the points to be staked.



006790_001

P0	Known station
P1...	Point to be staked

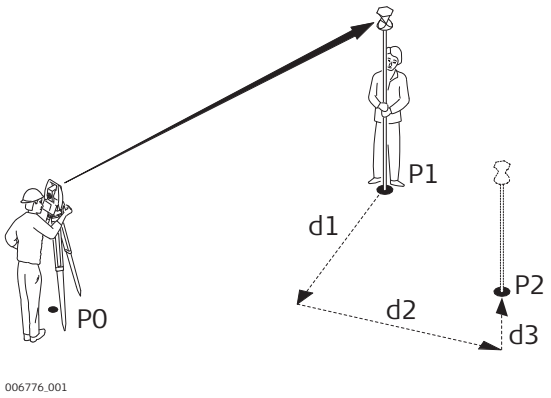
The points to be staked can:

- Be uploaded as a file to a project. Refer to "Importing data to the project step-by-step" for more information.
- Be created within the **Draw** application, and accessed directly. Refer to "9 How to Sketch a Plan".

This chapter explains how to stake out points, lines, and arcs, using **GPS** and **Total Station**.

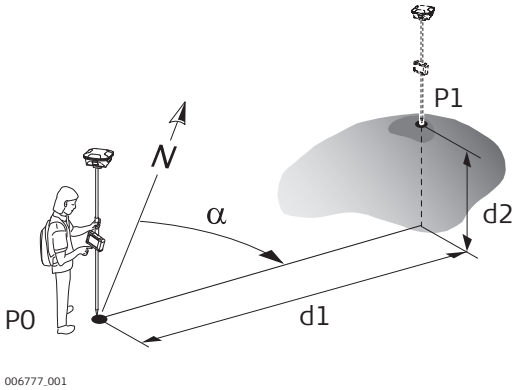
For information about staking out Surfaces refer to "11 How to Stake Out Surfaces".

Stake Out elements, TPS



P0	Station
P1	Current position
P2	Point to be staked
d1	Stake out element
d2	Stake out element
d3	Stake out element

Stake Out elements, GPS

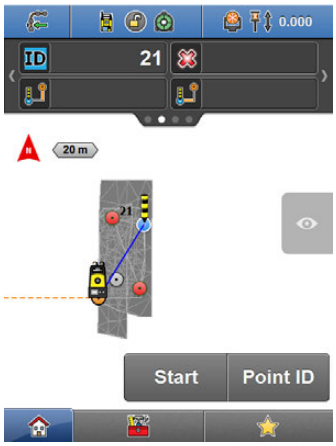


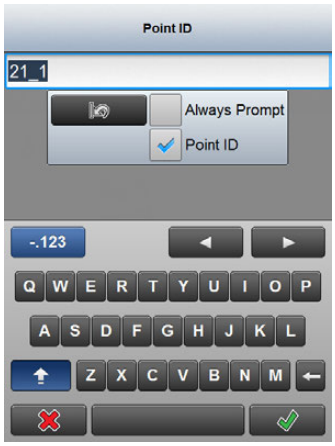
P0	Current position
P1	Point to be staked
d1	Stake out distance
d2	Height difference between current position and point to be staked
α	Stake out direction

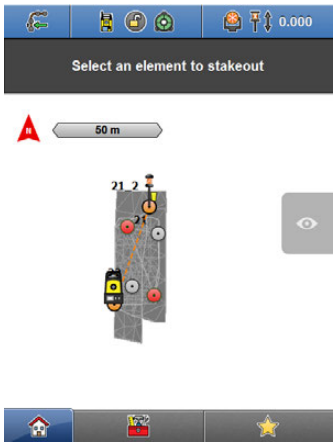
Associate Point ID to Stakeout point

iCON site allows to associate a Point ID to a Stakeout point:

Select **Stakeout** from the Home Menu. Map screen is displayed. Select an element to stake. Configure the Measure bar to display **Point ID**, then tap **Point ID**. Tap on the **Point ID** tick box and tap to accept. Measure and store a new point. This point will be recorded with the associated Point ID.

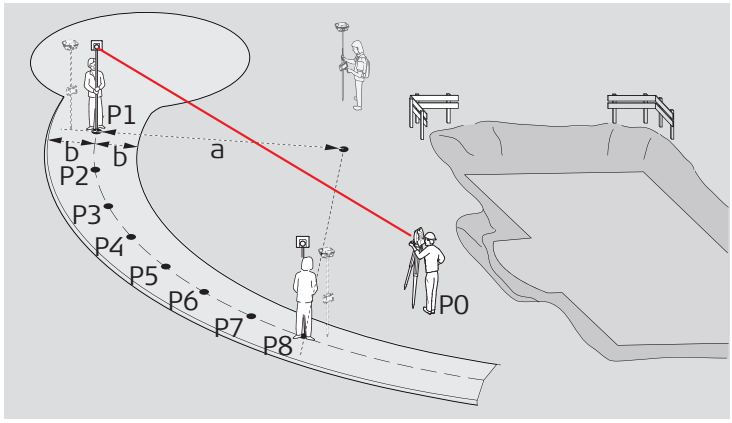






When a line is selected as stakeout element the associated name will follow this convention: start point ID minus end point ID underscore additional number. For example for a line from point ID 10 to point ID 17 it will be 10-17_1, 10-17_2 and so on.

General description



006778_001

P0 Known station
P1 ... Layout points
a Radius
b Offset

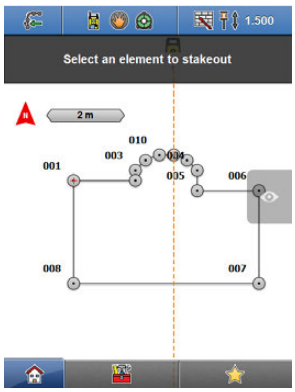
Given:

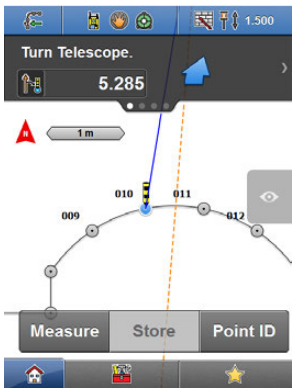
- Instrument is connected and setup with known station and height.
- Points are active within the current job. Refer to "Importing data to the project step-by-step".

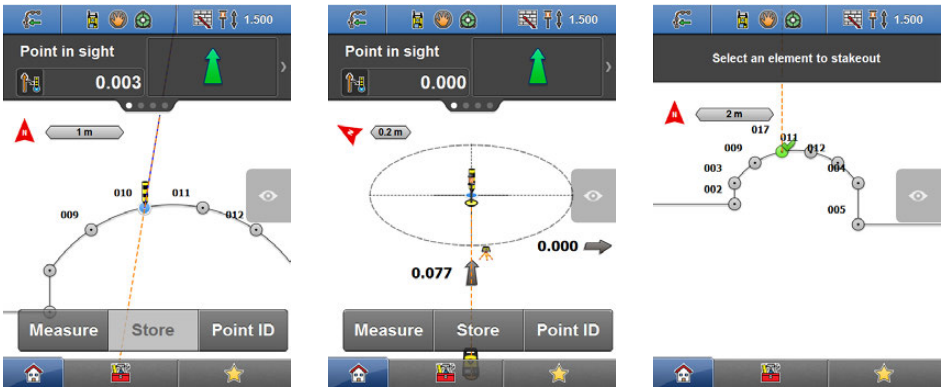
Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

Stake out points step-by-step

Step	Description
1.	Select **Stakeout** from the Home Menu. Map screen is displayed. Select the point to stake, then follow the guidance to navigate the target to the point.

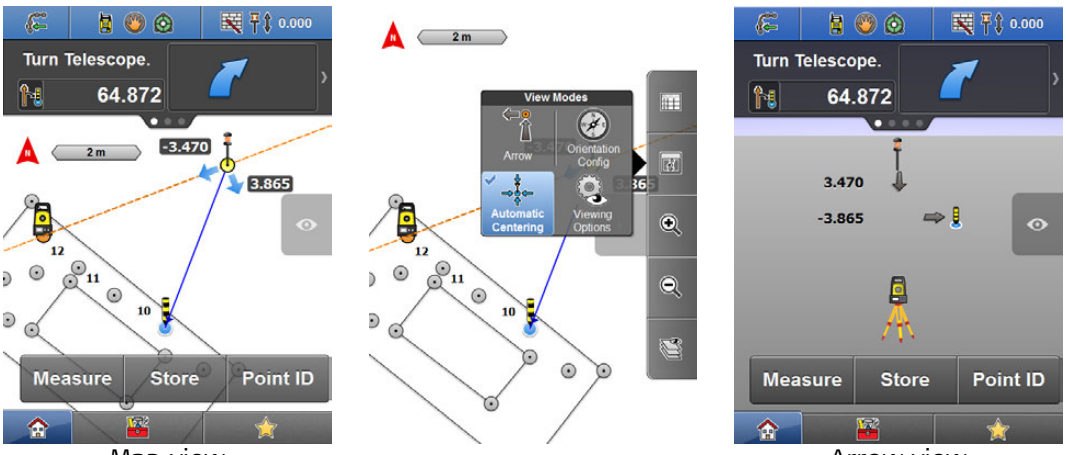




Step	Description
2.	Once telescope is aimed to target point, press **Measure**. The difference between the measured point and the point to be staked is displayed. The colour of the measured point indicates whether it is within tolerance. Record the point by tapping **Store**, or measure again, using **Measure**. Once the location is marked, the next point can then be selected, and the process can repeat. 
☞	Define **Measure Mode** in the Status 1 menu.
☞	Tolerances can be set in **Units** , which is found in the Home Menu.
☞	**GPS and Robotic Total Station approach:** As the target moves around, real-time measurement data and guidance information is constantly displayed in the **Information bar**. Once the point in the screen turns green, the point is staked within tolerance. To record points using the Total Station, press **Store**. If using GPS, press **Measure**.

Changing the view

Access **View Modes** in the Map handler to toggle between **Map** view and **Arrow** view. The arrow view displays the pole position in relation to an user defined orientation direction. Arrows and corresponding distances are displayed to indicate how to find the point to be staked.

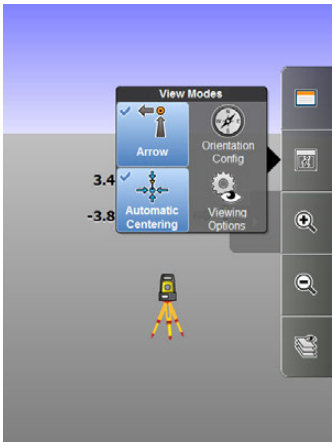


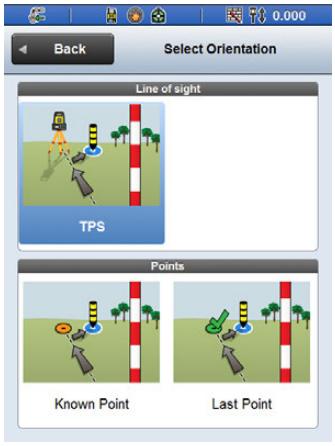
Map view Arrow view

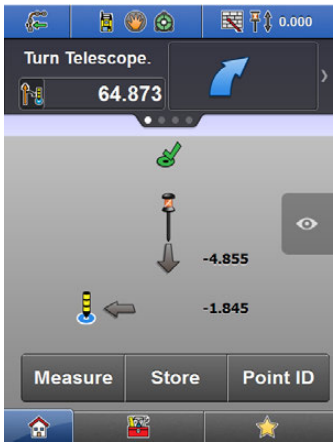
☞ To select a different point to be staked in the Arrow view and Bullseye view – just tap anywhere in the Map. Both Map and Arrow view are automatically changing to a Bullseye view if the target is within 2 m distance to the selected point.

Configuring the Orientation direction

Access **View Modes** in the Map handler and tap **Orientation Config** to define the view direction of the Arrow view and the Bullseye view.







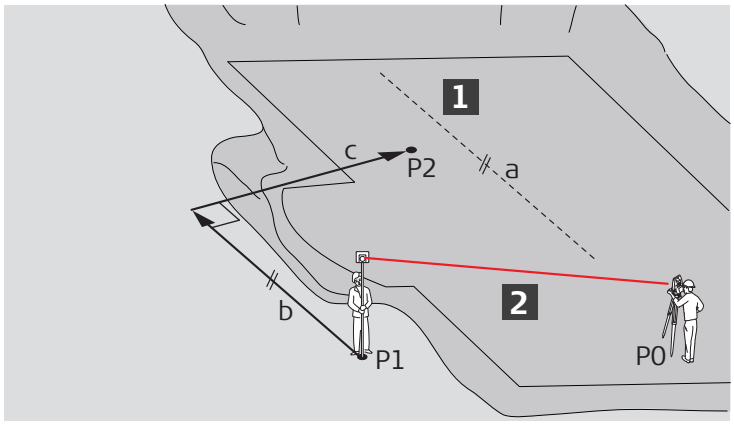
☞ This is for **TPS**. For **GPS** there are the additional methods **Sun** and **North** instead of TPS.

☞ The current active Orientation is highlighted in blue.

Overview of the available orientation methods

Method	Description
TPS	**TPS** only: Aligns the view along the line of sight, from pole to Total Station.
Known Point	Aligns the view from pole to another point of the map. That point needs to be selected during configuration to this method.
Last Point	Aligns the view from pole to the last staked and stored point.
North	**GPS** only: Aligns the view from pole to North direction of the coordinate system.
Sun	**GPS** only: Aligns the view from pole to the direction of the sun.

General description



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P0	Known station
P1	Measured point
P2	Point to be staked
a	Reference line
b	Line
c	Offset

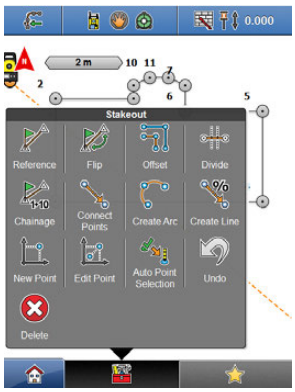
Given:

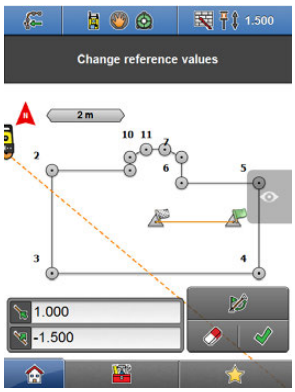
- Instrument is connected and setup with known station and height.
- Points are active within the current job. Refer to "Importing data to the project step-by-step".

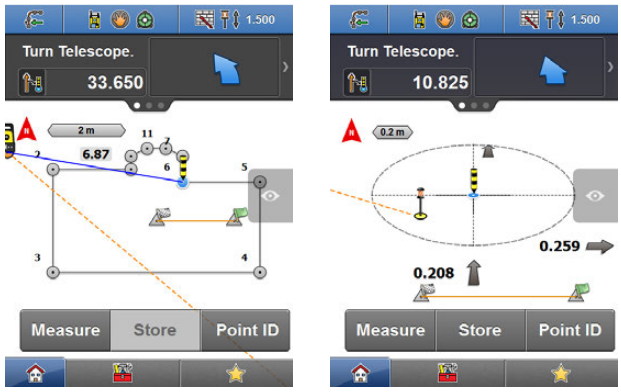
☞ Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

Stake out points with reference to a line step-by-step

Step	Description
1.	Select **Stakeout** from the Home Menu. Select **Reference** from the Toolbox. Define the reference line, then use the Toolbar to define any offset for the line. Tap to accept.



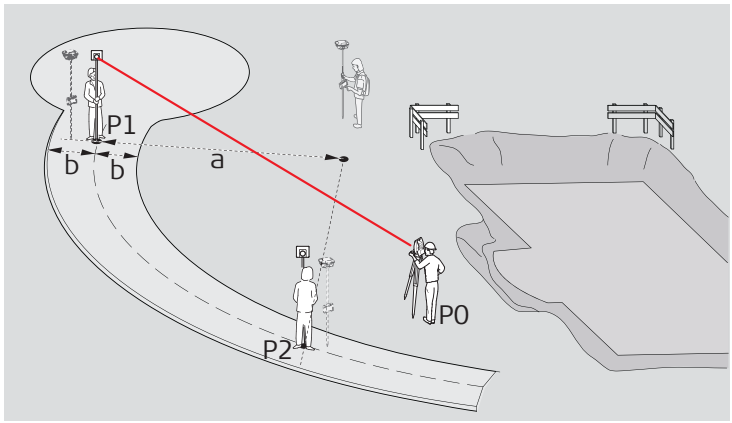


Step	Description
2.	Select a point to stake, and then press **Measure**. The difference between the measured point and the point to be staked is displayed, with reference to the line that was defined. Once the location is marked (in the field) and stored, the next point can then be selected, and the process can repeat. 
☞	**GPS and Robotic Total Station approach:** As the target moves around, real-time measurement data and guidance information is constantly displayed in the **Information bar**. Once the point in the screen turns green, the point is staked within tolerance. To record points using the Total Station, press **Store**. If using GPS, press **Measure**.

10.4 Stake Out Lines and Arcs

TPS + GPS

General description



006781_001

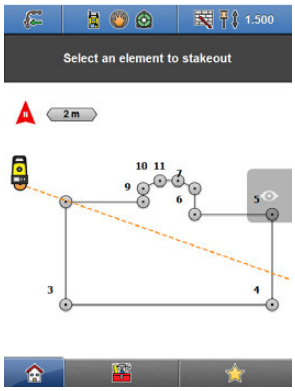
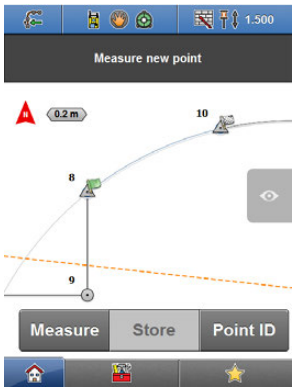
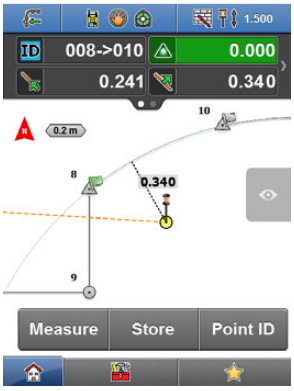
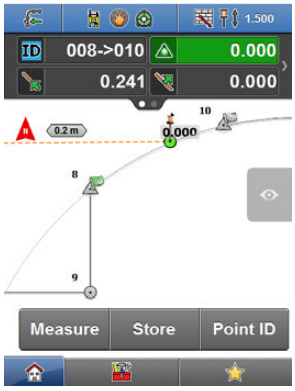
P0 Known station
P1 ... Layout points
a Radius
b Offset

Given:

- Instrument is connected and setup with known station and height.
- Points/lines/arcs are available in the current job. Refer to "Importing data to the project step-by-step".

☞ Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

Stake out lines and arcs step-by-step

Step	Description
1.	Select **Stakeout** from the Home Menu. Define or select the line/arc to stake by tapping the relevant elements. To change the direction of the line, select **flip** from the Toolbox. Once the line is defined, press **Measure**.  
2.	Once the target is within tolerance, it changes colour to green. Press **Store**. Mark the staked position (in the field). This process can repeat along the same line. To stake another line, tap the preferred line, and continue the process.  
☞	Define **Measure Mode** in the Status 1 menu.
☞	**GPS and Robotic Total Station approach:** As the target moves around, real-time measurement data and guidance information is constantly displayed in the **Information bar**. Once the point in the screen turns green, the point is staked within tolerance. To record points using the Total Station, press **Store**. If using GPS, press **Measure**.

Description

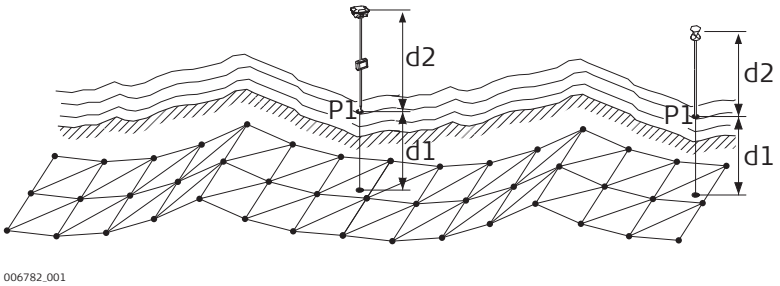
Function		Description
New Point		Insert a point into the map by entering the required coordinates. This point can then be staked. The new point can also be defined as Control Point.
Edit Point		After selecting a point from the map, permitted values can be edited.
Undo		Undo previous action.
Delete		Remove points/lines/arcs.
Create Arc		Tap points to create an arc to be staked.
Create Line		Tap points to create a line to be staked.
Connect Points		Tap points to create a line between these points.
Reference		Stake points with reference to a line.
Flip		Switch the start point and end point of the active line.
Chainage		Activates the use of chainages.
Divide		Divide a line or arc into segments.
Offset		Offset an element to be staked.
Auto Point Selection		Set this option to **On** to have the next point to stake selected automatically by the instrument according to the settings: • **Next from list**: the next point from the list of points to stake is selected automatically. • **Nearest**: the point closest to the last staked point is selected automatically. • **Nearest from list**: the point from the list that is closest to the last staked point is selected automatically.

General description

A Digital Terrain Model (**DTM**) can be staked for height values. The heights of the measured positions are compared with the heights of the Terrain Model at the same position. The height differences are displayed in the Information bar in a **Cut**/**Fill** format.

Staking a Terrain Model can be used for:

- Staking out where the Terrain Model represents the surface to be staked.
- Quality control purposes, where the Terrain Model represents the final project surface.



P1 Point to be staked
d1 Cut/Fill
d2 Antenna / target height

Given:

- Instrument is connected and setup with known station and height.
- Terrain Model active within the current job. Refer to "Importing data to the project step-by-step".

☞ The **Cut & Fill** procedure is the same as in the **Stakeout** application, except the heights to be staked are taken from the selected Terrain Model.

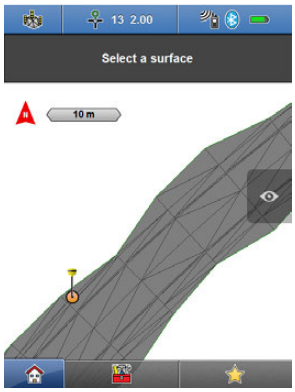
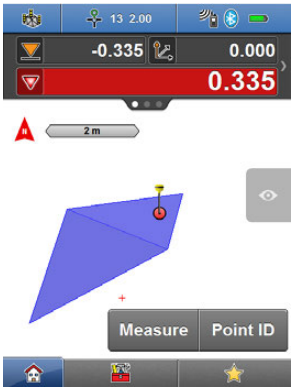
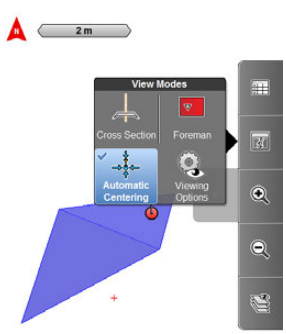
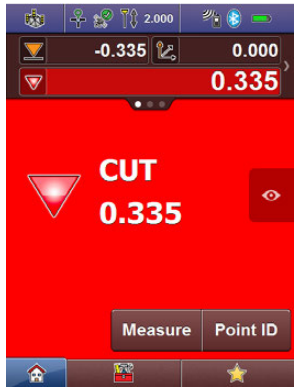
☞ Note that main workflow refers to GPS. For Total Station press **Measure**, then **Store**.

Cut/Fill can be carried out in three ways:

- Manual Total Station
- Robotic Total Station
- GPS

If using **Manual Total Station**, the Information bar is updated after each point is measured.
If using Total Station in **Continuous Mode**, or if using **GPS**, real time measurement data is displayed automatically in the Information bar.

How to stake out surfaces step-by-step

Step	Description
1.	Select **Cut & Fill** from the Home Menu. Tap the required Terrain Model. As the pole moves across the surface, real-time measurement data is displayed in the Information bar. The **Cut/Fill** value is colour coded, depending on whether the height is above-grade, below-grade, or on-grade, when compared with the Terrain Model. Refer to "Cut/Fill colour indicators" for details. 
2.	Record points by tapping **Measure**. The colour of the stored point indicates whether the point is **in** or **out** of **height tolerance**. The process can repeat.
3.	**Cut & Fill** offers a **Foreman View**, which displays the **Cut/Fill** value in large letters and digits on a colour coded background. To activate, access **View Modes** in the Map handler and tap **Foreman**. To return to standard view deactivate **Foreman** the same way.   
☞	The Cut/Fill tolerance level can be selected in **Tolerances**, which is found in **Units** .

Cut/Fill colour indicators

Indicator	Description
Cut	Indicates the height measurement is above the surface design. When colour changes to green the measured position is within the defined tolerance but still above the surface design.
Fill	Indicates the height measurement is below the surface design. When colour changes to green the measured position is within the defined tolerance but still below the surface design.
On Grade	Indicates the height measurement exactly matches the surface design.

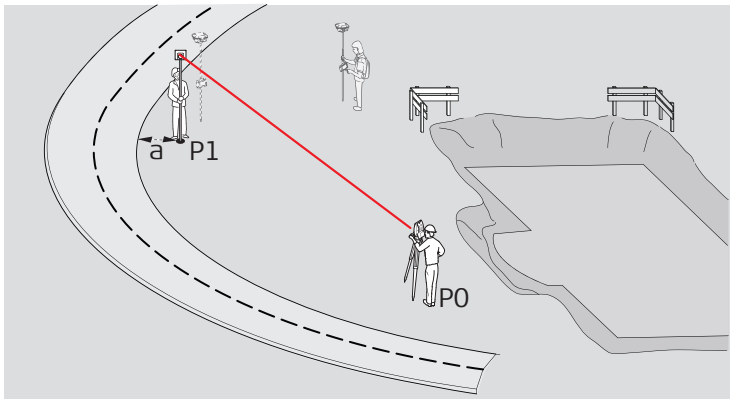
Toolbox functions

The Toolbox contains some additional functions.

Function	Description
Automatic Logging	Set the automatic logging **Mode** to **On**/**Off**. Select **Distance** or **Time** for the logging mode, and define the Interval.
Reference	Stake out with reference to a line, which is defined by tapping elements on the screen. **Line and Offset** values are displayed in the Information bar. These values are derived from the North and East values of the line. The height value is derived from the height of the Terrain Model.
Fix Heading	A cross-section can be defined perpendicular to the current heading based on the walking path. To fix the calculation of cross-sections based on the last heading tap **Fix Heading**.
Offset	Vertically offset the whole Terrain Model. **Cut**/**Fill** values in the Information bar are altered according to the offset applied.
Stake Elevation	Stake out with reference to a height, which is defined: • by selecting an existing point, • by entering the height directly, or • or by selecting an area. The reference height is automatically calculated to the **balanced height** of the area. **Cut**/**Fill** values in the Information bar are altered according to the reference height applied.
Flip	Switch the start point and end point of the active line. Available in the Tool bar.
Chainage	Activates the use of chainages.

General description

The **Roading** application is used to place marks in the field along predetermined road lines or cross-sections. These predetermined road lines are the lines to be staked.



006792_001

P0 Known station
P1 ... Layout line
a Offset

The road lines to be staked can be uploaded as a file to a project. Refer to "Importing data to the project step-by-step" for more information.

This chapter explains how to stake out road lines using **GPS** and **Total Station**.

Given:

- Instrument is connected and setup with known station and height.
- Road model active within the current job. Refer to "Importing data to the project step-by-step".

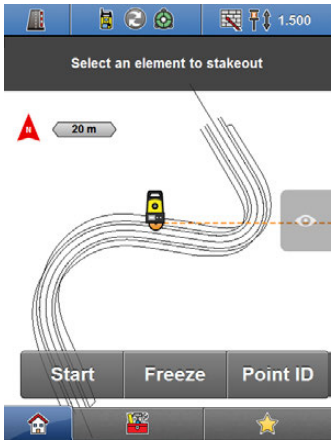
Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

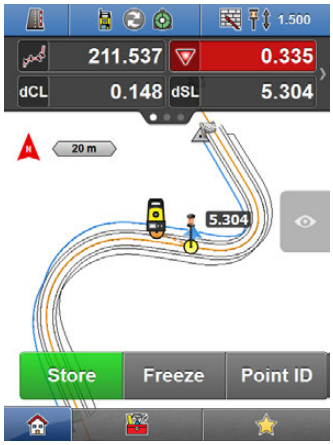
Roading is an optional application for the Leica iCON CC60/CC61/CC65/CC66 controller. Ask your agency or your Leica Geosystems representative for information about licensing.

Stake out road lines

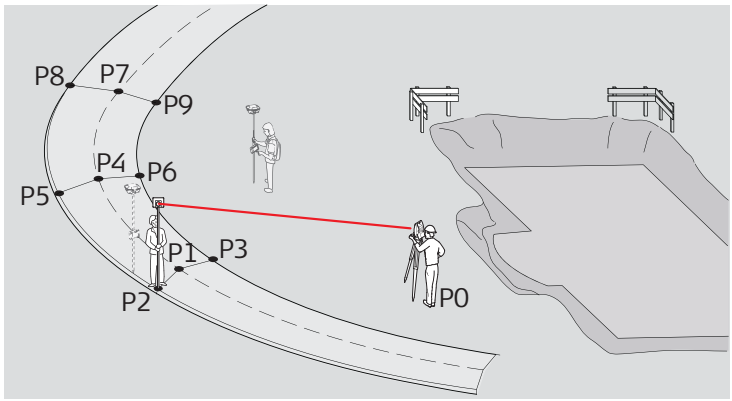
Select **Roading** from the Home Menu. Map screen is displayed. Select the road line to stake, then follow the guidance to navigate the target to the road line. Once the line is defined, press **Start**.

Once the target is within tolerance, it changes colour to green. Press **Store**. Mark the staked position (in the field). This process can be repeated along the same line. To stake another line, tap the preferred line, and continue the process.





General description



006793_001

P0	Known station
P1 .. P9	Point to be staked

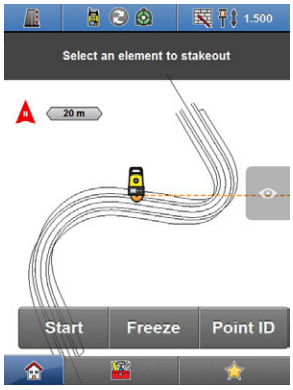
Given:

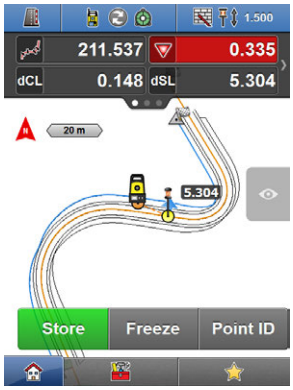
- Instrument is connected and setup with known station and height.
- Road model active within the current job. Refer to "Importing data to the project step-by-step".

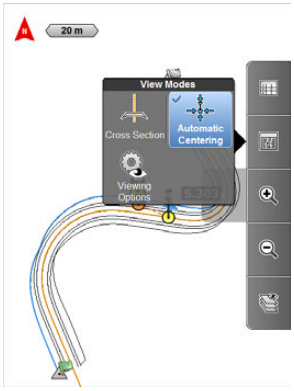
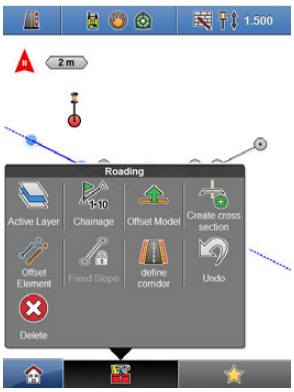
Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

Stake out cross-sections step-by-step

Step	Description
1.	Select **Roading** from the Home Menu. Map screen is displayed. Select the road line to stake, then follow the guidance to navigate the target to the road line.





Step	Description
2.	Once a measurement is available, select **Cross Section** view from the **Map Handler**. The view mode changes into cross-section. The target is shown against the current cross-section of the selected road model. To change view mode back to map view, deselect **Cross Section** view from the **Map Handler**.  If a cross-slope element is selected the pole icon shows the Cut/Fill colours. If a point is stored it is colour coded based on Cut/Fill colour and tolerance settings.
3.	To offset an individual string line or a cross-slope select **Offset Element**. Select the element required for offset, then enter an **Offset** value. Use **Flip** to switch the offset value from positive to negative. To define a vertical offset for the element tap , for a horizontal offset tap . Tap to accept. 

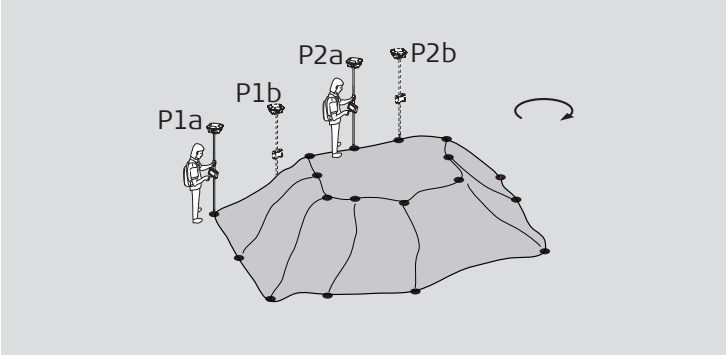
Description

Function	Description
Active Layer	Select the active layer of the current active road line model.
Chainage	Activates the use of changeable chainages.
Offset Model	Offsets the whole model by entered value.
Create cross section	Create cross-sections using different methods.
Offset Element	Offsets the selected element, for example cross-slopes or individual string lines, by entered value in map and cross-section view.
Fixed Slope	Hold and extend the slope of a selected cross-slope element.
Define Corridor	Corridor function for cross-sections. Define the limiting values of the corridor. ☞ Cross-section calculation is restrained by the defined corridor.
Undo	Undo previous action.
Delete	Remove points/lines.

Description

Function	Description
Chainage	Indicates the chainage of the measured point on the centreline.
iCh	Indicates the chainage of the measured point on the selected stringline.
dCL	Indicates the perpendicular distance from the centreline to the measured point. A negative value means that the point is to the left of the line.
dSL	Indicates the perpendicular distance from the stringline to the measured point. A negative value means that the point is to the left of the line.
dHSL	Indicates the height difference at the measured position to the selected stringline. Negative means below, positive above the stringline.
sSlp	Indicates the cross section slope at the measured point. Negative means sloping down from the road centreline.
lSlp	Indicates the long slope at the measured point. Negative means down sloping in the line direction.
Din	Inner distance. Indicates the distance from the measured point to the inner edge of the current element (the edge closest to the centreline).
Dout	Outer distance. Indicates the distance from the measured point to the outer edge of the element (the edge most far away from the centreline).
dHix	Side distance to the point in the current chainage where current height intersects the theoretic road profile. For example useful when building up a road bank.
Layer	Indicates the layer of the stringline model that will be used as a reference.
Offset Model	Indicates the applied vertical offset value.
Offset Element	Indicates the applied vertical offset value.
Slope Dist. In	Indicates the sloped distance from the measured point to the inner edge of the element.
Slope Dist. Out	Indicates the sloped distance from the measured point to the outer edge of the element.

General description



006783_001

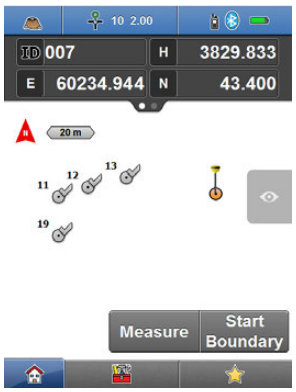
P1a... Boundary point
P2a... Surface point

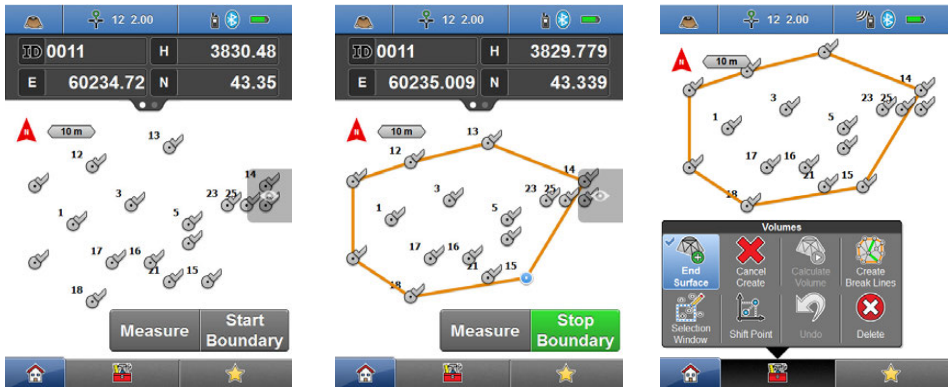
Given:

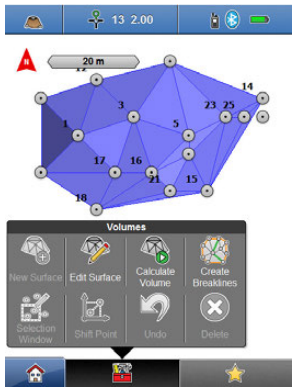
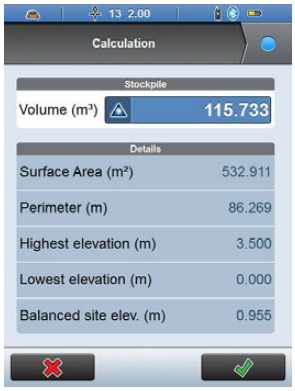
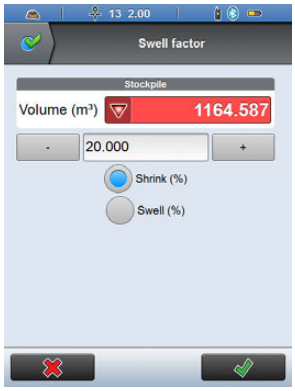
- Instrument is connected and setup.

Note that main workflow refers to GPS. For Total Station press **Measure**, then **Store**.

Measure volume and make a stock-pile calculation step-by-step

Step	Description
1.	Select **Volumes** from the Home Menu. Select **New Surface** from the **Toolbox**. Press **Measure** to record as many points as required. 
	TPS only: To setup the instrument in a second location in order to measure further points, tap the **Setup** key in the Navigation bar. The Station Setup screen opens. Refer to "4 How to Setup a Total Station" for information about station setup. After the station setup is complete, the Volumes application automatically returns, and measuring can be resumed.

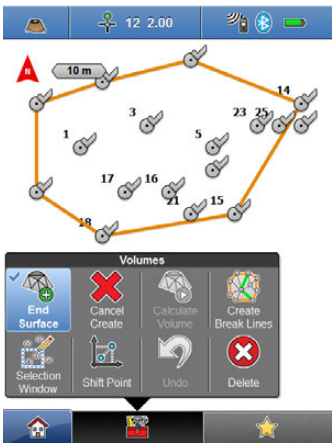
Step	Description
2.	If a Boundary is required, select **Start Boundary** in the Measure bar. Tap relevant points on screen to connect all boundary points. Close the boundary by tapping the first boundary point again, then tap **Stop Boundary**. The Terrain model is applied to all points within the boundary. Finish surface creation by tapping **End Surface** in the Toolbox.  ☞ It is possible to activate **Start Boundary** before measuring boundary points. After boundary points are measured, press **Stop Boundary**. All surface points can then be measured.
3.	If a break line is required, define that line before tapping **End Surface** or select the surface and then **Edit Surface** in the Toolbox. Now tap **Create Break Lines** in the Toolbox, then select **Start Break Lines** in the Measure bar. Tap relevant points on screen or measure additional points. Finish break line creation by tapping **Stop Breaklines** in the Measure bar. Tap **End Surface** in the Toolbox to save the changed surface. ☞ Break lines are displayed as bold light green lines, while boundary lines are bold orange.

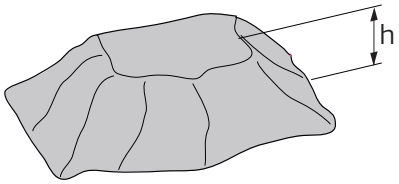
Step	Description
4.	Once the surface is defined, select **Calculate Volume** from the **Toolbox**. Select **Stockpile**, and tap ✓ to accept. The Volume Calculation Wizard begins. Step 1 of the wizard displays the volume of the selected surface, along with measurement data. In Step 2, calculate the new volume based on a percentage **Shrink (%)** or **Swell (%)** of the selected surface. In Step 3, the calculation can be saved.   

13.2 Calculate Volumes to an Elevation

TPS + GPS

General description





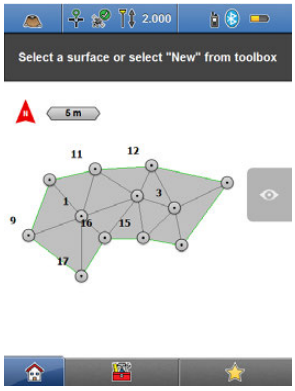
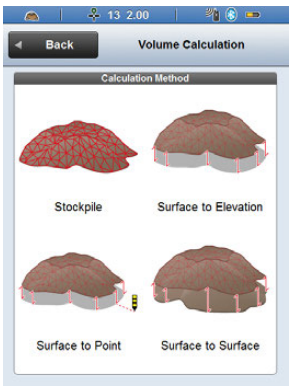
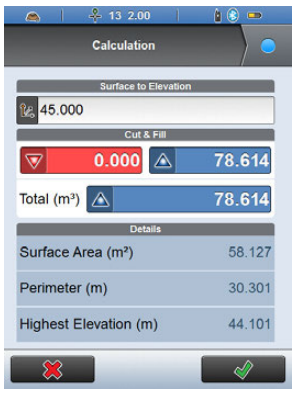
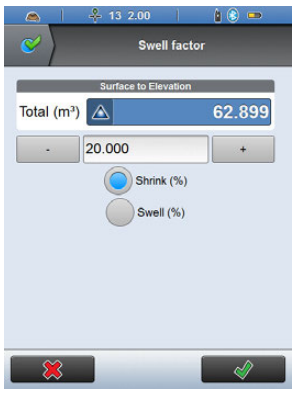
006784_001

h Elevation

Given:

- Surface file available in active job. It can be either previously created in the **Volumes** application (refer to "13.1 Measure Volume and Make a Stockpile Calculation", steps 1 & 2), or imported as a reference (refer to "Importing data to the project step-by-step").

Calculate volumes to an elevation step-by-step

Step	Description
1.	Select **Volumes** from the Home Menu. Tap the displayed surface to select it. Select **Calculate Volume** from the **Toolbox**. 
☞	To display different surfaces use **Map view manager**, refer to "Map View manager".
2.	Select **Surface to Elevation** in the Calculation Method screen. The Surface to Elevation Wizard begins. In Step 1 of the wizard, input the desired elevation. The volume is recalculated according to the new elevation. In Step 2, calculate the new volume based on a percentage **Shrink (%)** or **Swell (%)** of the selected surface. In Step 3, the calculation can be saved.   
☞	Select **Surface to Point** as a volume calculation method to calculate the volume according to the height value of a specific point.
☞	Select **Surface to Surface** as a volume calculation method to calculate the volume between two separate surfaces. The calculated volume is based upon where the two surfaces overlap.

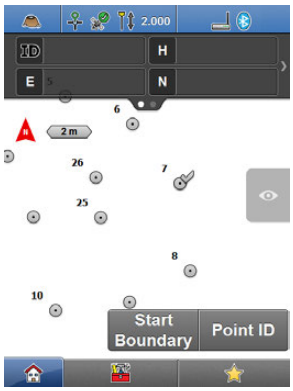
General description

Given:

- There are points available in the Project and Job, which are set to visible in the map.

☞ Note that only points with an elevation can be used for the creation of surfaces. This is also valid for defining a Boundary.

Create a surface with existing points step-by-step

Step	Description
1.	Select **Volumes** from the Home Menu. Select **New Surface** from the **Toolbox**. Instead of measuring new points **tap existing points** in the map to be included in the surface. 
2.	To select several existing points at once instead of tapping each of them select **Selection Window** from the **Toolbox**. Define a box by tapping two corners. All points inside of this box are selected automatically.
☞	Note that multiple selection windows can be defined to select additional points.
☞	To deselect several points – activate the rubber in the Toolbar and tap two corners.

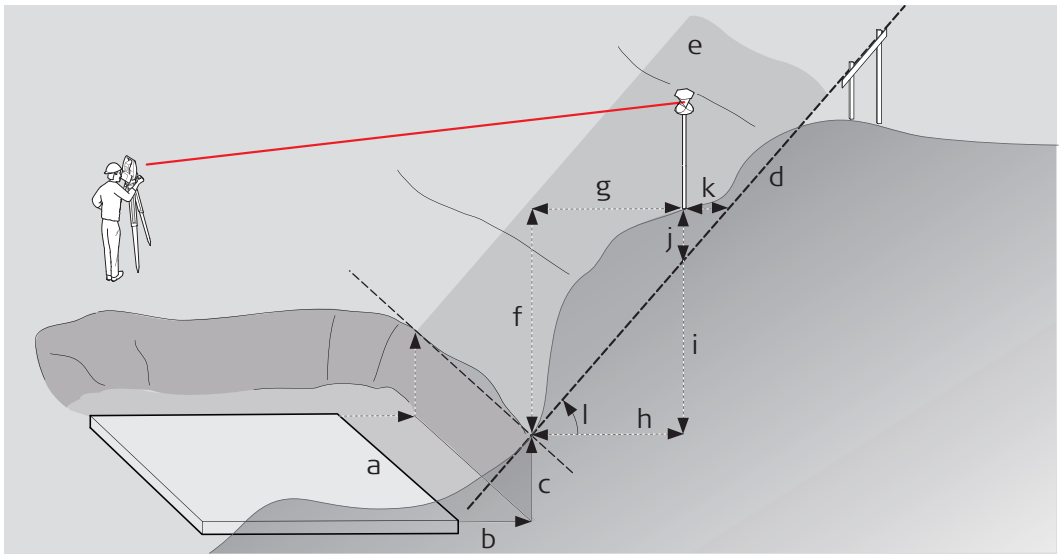
General description

Slopes is an application that allows to stake out regular slopes and batter boards. In general, the user defines a sloped reference plane. Afterwards positions can be measured on the site and these measured positions are compared with the sloped reference plane.

The application can be used for:

- **Checks on a defined slope**: The operator moves around the sloped area and takes measurements to check if the current status is ok, below or above the designed surface.
- **Staking and mounting the batter board**: To mark the design slope by installing a board onto two pegs, that has the same slope as the design and is exactly in the sloped designed plane.
- **Finding the Daylight line**: The intersection of the current real surface and the designed surface is called Daylight line. This line is exactly the place where the excavator needs to start digging off the ground to build the designed slope.
- **Finding the Daylight point**: In this case a sloped line is used instead of a sloped plane. The daylight point and how to get to this position are the values of interest and can be used for inclined pile ramming or drilling.

The following is a step-by-step guide to using some of the key functions in Slopes: a single line as reference together with a regular slope definition. Afterwards the Daylight line can be marked and a batter board built up, starting at that location.



006794_001

a) Reference line
b) Horizontal offset
c) Vertical offset
d) Reference slope
e) Sloped reference plane
f) Reference height offset (v)
g) Reference offset (h)
h) Horizontal design value
i) Vertical design value
j) Cut/Fill value
k) **dHix** value: horizontal distance to the design slope
l) Elevation angle

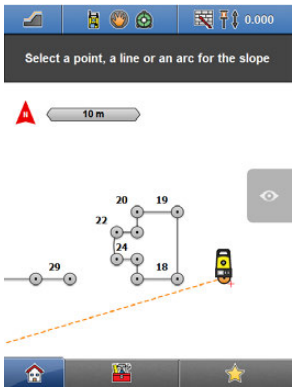
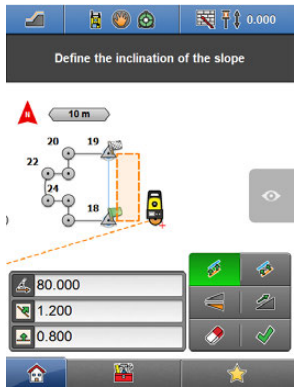
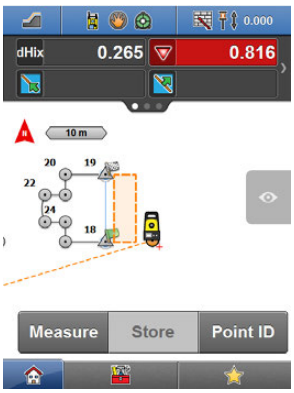
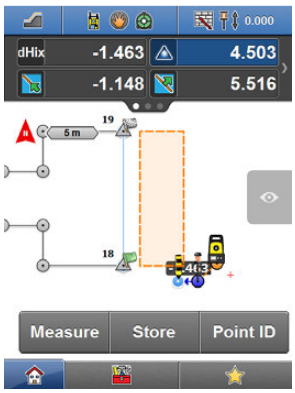
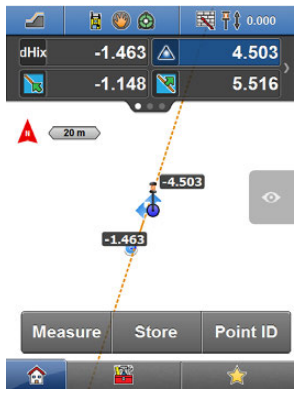
Given:

- Instrument is connected and setup with known station and height.

☞ Note that main workflow refers to Total Station. For GPS press **Measure** to record a point.

☞ iCON site requires an additional license to use this application.

How to handle slopes step-by-step

Step	Description
1.	Select **Slopes** from the Home Menu. Select the reference element. If needed, set a horizontal and/or vertical offset. Now define the inclination of the slope. Inclination can be **%**, **V:H**, **H:V** or **Elev. Angle**, depending on the current active setting for slope display. Define the direction and on which side of the reference element the slope will be. Once the slope is defined, tap to accept.  
☞	For a **vertical** calculation of the Cut/Fill value tap , for a calculation **perpendicular to the slope** tap .
☞	To change the direction of the slope (seen from start point to end point of the selected line), select **Flip** .
☞	To change between increasing and decreasing slope tap the corresponding key.
2.	After defining the slope measurements can be started. Aim telescope to target point, then press **Measure**. Once a measurement is available, calculated values are displayed. The most important values are **Cut**/**Fill** as the height difference between the measured point and the defined slope, and the **dHix** value for the distance to the daylight line at the height of the measured point. To change to cross-section view mode select **Cross Section** from the Map Handler. The target is shown against the current cross-section of the defined slope, **dHix** is the horizontal distance to the design slope.   

Toolbox functions

The Toolbox contains some additional functions.

Function	Description
Battered Pile	Allows the settings for tilted pile ramming and delivers information for the Daylight point and the referenced angle.
Maximum Height	Set the maximum height for the defined slope. For example useful to indicate the exact size of the sloped area in the map.
Edit Slope	Edit values of the defined slope, including horizontal and vertical offset.

15 How to Use Machine Calibration

TPS

The iCON site software offers a simple workflow for a Machine calibration. All required points to be measured are shown at each individual machine type. A report can be used to enter the results manually into the machine control system. This helps to decrease installation time and leads to reproducible results.

The **MC Calibration** application is available for:

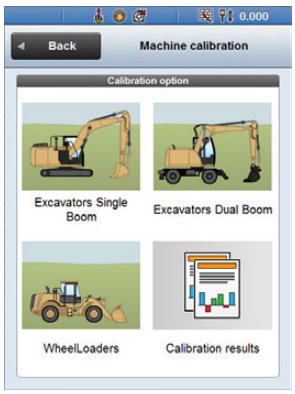
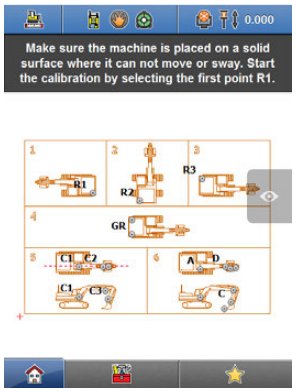
- **Single-Boom Excavators**
- **Dual-Boom Excavators**
- **Wheel Loaders**

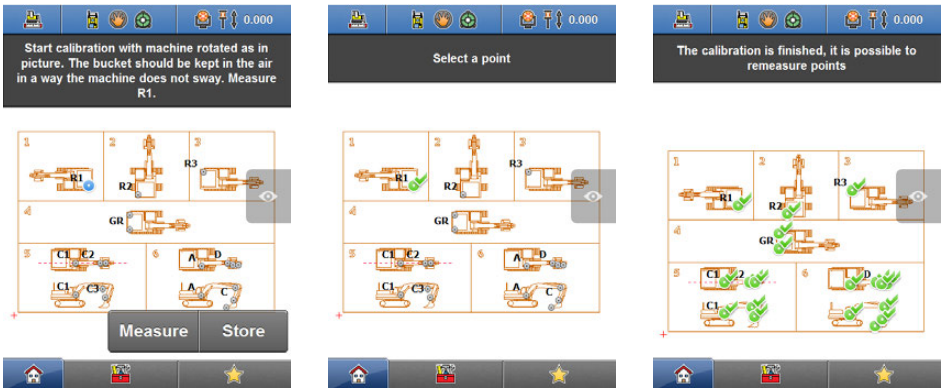
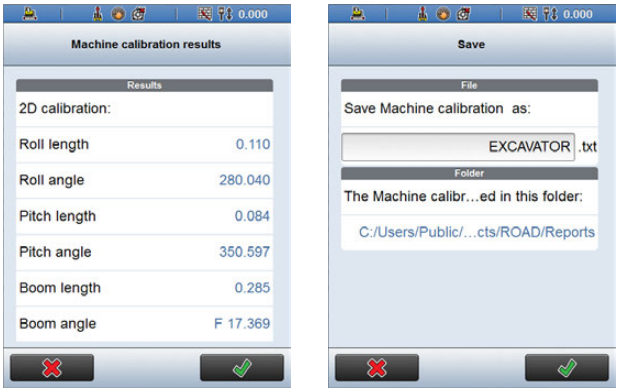
The different workflows are described in the following chapters.

15.1 Machine Calibration for Single Boom Excavators

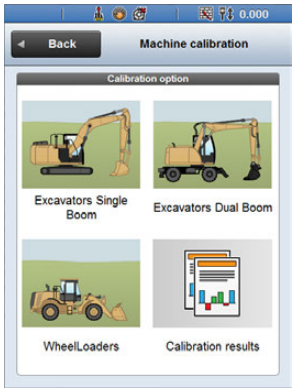
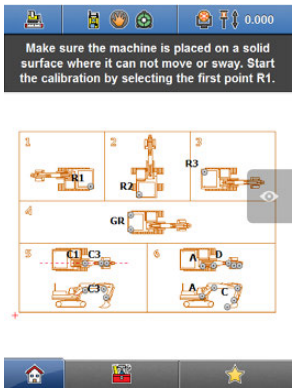
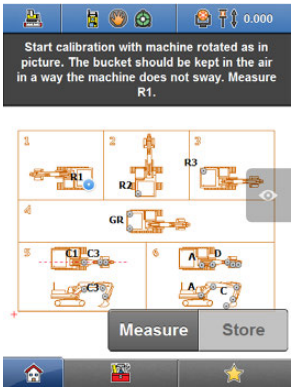
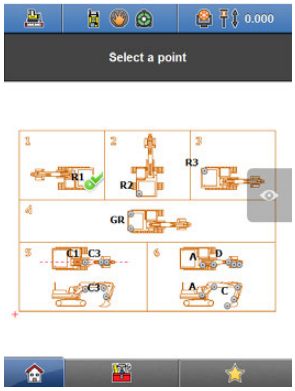
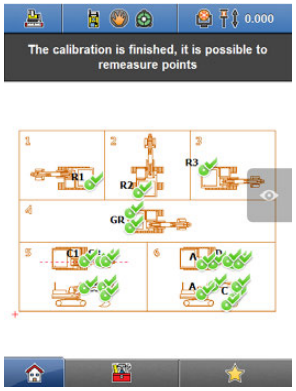
TPS

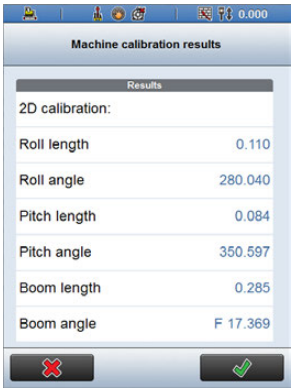
Machine calibration for single boom excavators step-by-step

Step	Description
	Before starting the machine calibration ensure the machine is placed approximately horizontal on a solid surface where it can not move or sway.
1.	Select **MC Calibration** from the Home Menu. Select **Single-Boom Excavators**. Select the start point R1 on the screen. It is very important to work off the displayed steps in the correct order.  

Step	Description
2.	☞ Always adhere to the instructions in the display. ☞ Take care to use correct settings for **Prism Type** and **Prism Height**. Aim telescope to target point, then press **Measure**, then **Store**. Select the next point. Aim telescope to target point, then press **Measure**, then **Store**. Repeat until all points have been measured successfully. To remeasure points, tap the relevant point, then **Measure** and **Store**. 
3.	When all points have been measured successfully, the **Machine calibration results** screen is displayed. The 2D results are displayed first, followed by the 3D results. Tap ✓ to accept. In the next step give the results file a name and tap ✓ to save. The results can be accessed again using **MC Calibration** › **Calibration results**. Alternatively, the saving process can be cancelled and points be remeasured. After successfully measuring points again, execute a recalculation using **Calculate** from the Toolbox. The new results will be displayed. 

Machine calibration for dual boom excavators step-by-step

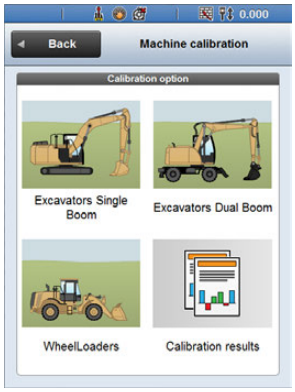
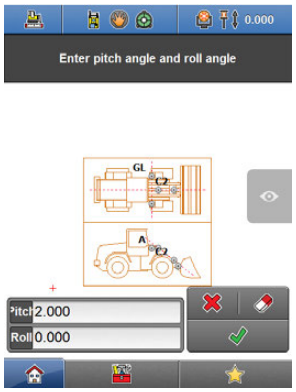
Step	Description
☞	Before starting the machine calibration ensure the machine is placed approximately horizontal on a solid surface where it can not move or sway.
1.	Select **MC Calibration** from the Home Menu. Select **Dual-Boom Excavators**. Select the start point R1 on the screen. ☞ It is very important to work off the displayed steps in the correct order.  
2.	☞ Always adhere to the instructions in the display. ☞ Take care to use correct settings for **Prism Type** and **Prism Height**. Aim telescope to target point, then press **Measure**, then **Store**. Select the next point. Aim telescope to target point, then press **Measure**, then **Store**. Repeat until all points have been measured successfully. To remeasure points, tap the relevant point, then **Measure** and **Store**.   

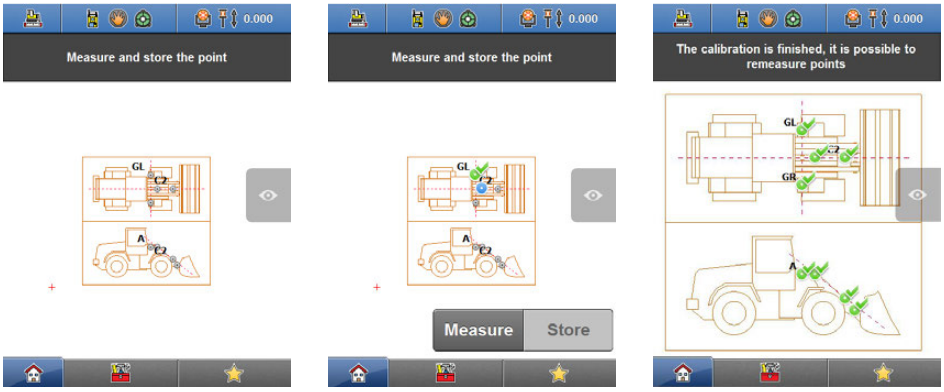
Step	Description
3.	When all points have been measured successfully, the **Machine calibration results** screen is displayed. The 2D results are displayed first, followed by the 3D results. Tap to accept. In the next step give the results file a name and tap to save. The results can be accessed again using **MC Calibration** › **Calibration results**. Alternatively, the saving process can be cancelled and points be remeasured. After successfully measuring points again, execute a recalculation using **Calculate** from the Toolbox. The new results will be displayed. 

15.3 Machine Calibration for Wheel Loaders

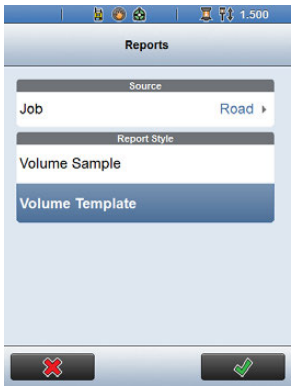
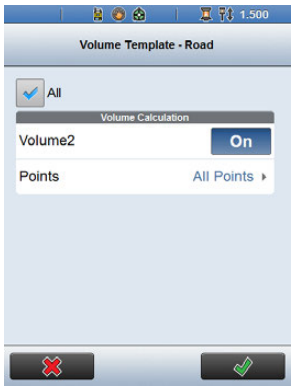
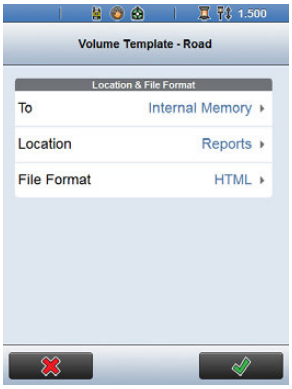
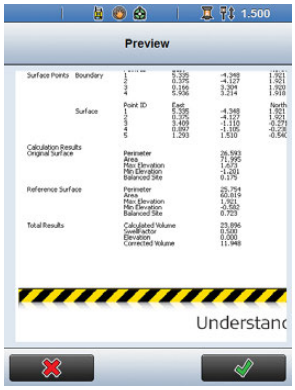
TPS

Machine calibration for wheel loaders step-by-step

Step	Description
☞	Before starting the machine calibration ensure the machine is placed approximately horizontal on a solid surface where it can not move or sway.
1.	Select **MC Calibration** from the Home Menu. Select **Wheel Loaders**. Enter pitch angle and roll angle, then tap .  

Step	Description
2.	Select the start point on the screen. Aim telescope to target point, then press **Measure**, then **Store**. Select the next point. Aim telescope to target point, then press **Measure**, then **Store**. Repeat until all points have been measured successfully. 
3.	When all points have been measured successfully, the **Machine calibration results** screen is displayed. The 2D results are displayed first, followed by the 3D results. Tap to accept. In the next step give the results file a name and tap to save. The results can be accessed again using **MC Calibration** › **Calibration results**. Alternatively, the saving process can be cancelled and points be remeasured. After successfully measuring points again, execute a recalculation using **Calculate** from the Toolbox. The new results will be displayed.

How to create a report step-by-step

Step	Description
1.	Select **Reports** from the Home Menu. A job selection and a list with the available Report Templates is shown. Select the concerned job, choose the desired Template and tap to accept. A list with all available data according to the selected Report template is shown. Select the content to be contained in the report and tap to accept.  
☞	The current active job is selected by default.
☞	Report templates need to be located in the folder: My Documents\Leica Geosystems\iCON\Config\ReportsConfig.
2.	Select the storing location and the desired file format. Tap . A preview is shown of what will be stored as Report file. Tap . The file is created at the chosen location.  
☞	The memory device can be the internal memory or a removable memory device.
☞	The location can be either the global Reports folder or the Reports folder within a project.
☞	The available report formats are TXT, CSV, PDF and HTML.

17 How to Use Telematics

17.1 General Introduction

Description

With a connection between the CC60/CC61/CC65/CC66 controller and the iCON telematics web page, **Telematics** offers:

- **View**: Enables a remote user to access the controller to view or control iCON site.
- **Sync**: To exchange data between the controller and a remote web page.
- **Track**: Enables a remote user to track the current position of the sensor.

☞ To use this functionality an account is needed for the iCON telematics web page. The license is handled on the controller. Ask your agency or your Leica Geosystems representative for information about licensing and how to get an account.

☞ An Internet connection on the controller is needed, either using a LAN cable, a wireless local area network connection (WLAN/WiFi), or a 3G modem. Refer to "17.2 Installing a SIM Card" for information about SIM card installation in the CC61/CC65/CC66 controller to use the 3G modem for Internet connection.

17.2 Installing a SIM Card

☞

- Keep the card dry.
- Use it only within the specified temperature range.
- Do not bend the card.
- Protect the card from direct impacts.

☞ Failure to follow these instructions could result in data loss and/or permanent damage to the card.

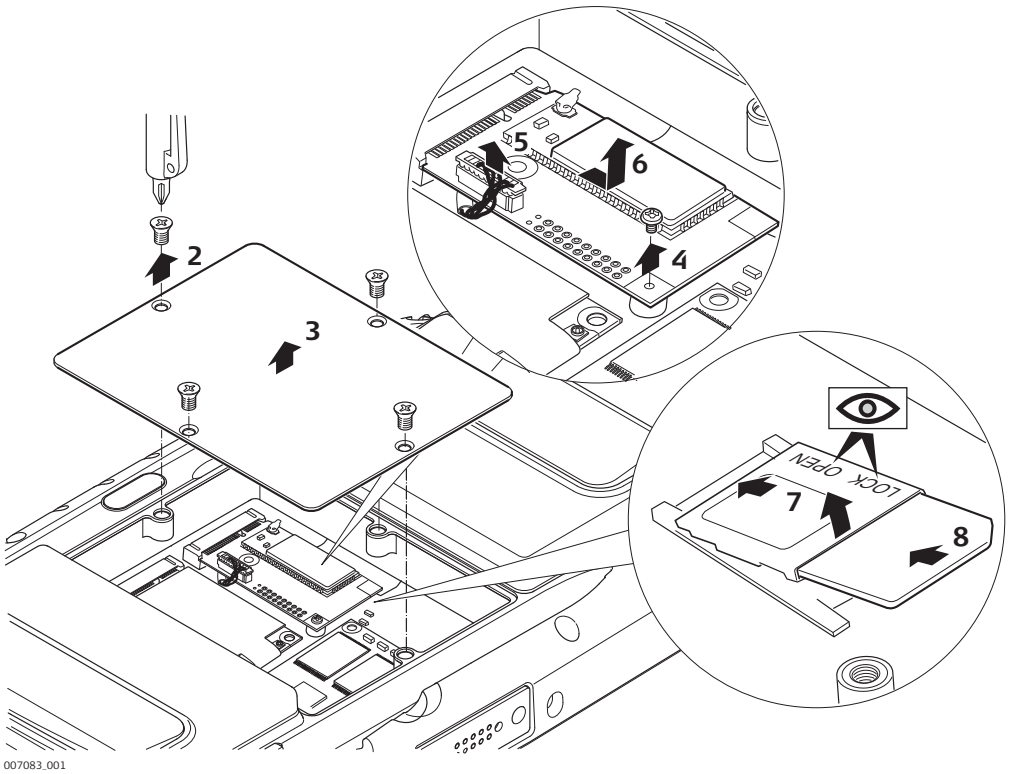
⚠ **CAUTION**

Always ground yourself to remove any static charge before touching the CPU card. The electronic devices are sensitive to static electricity.

Precautions:

1) Only experienced personnel should open the mechanical housing of the tablet computer.
2) Use a grounding wrist strap all the time.
3) Place all the electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

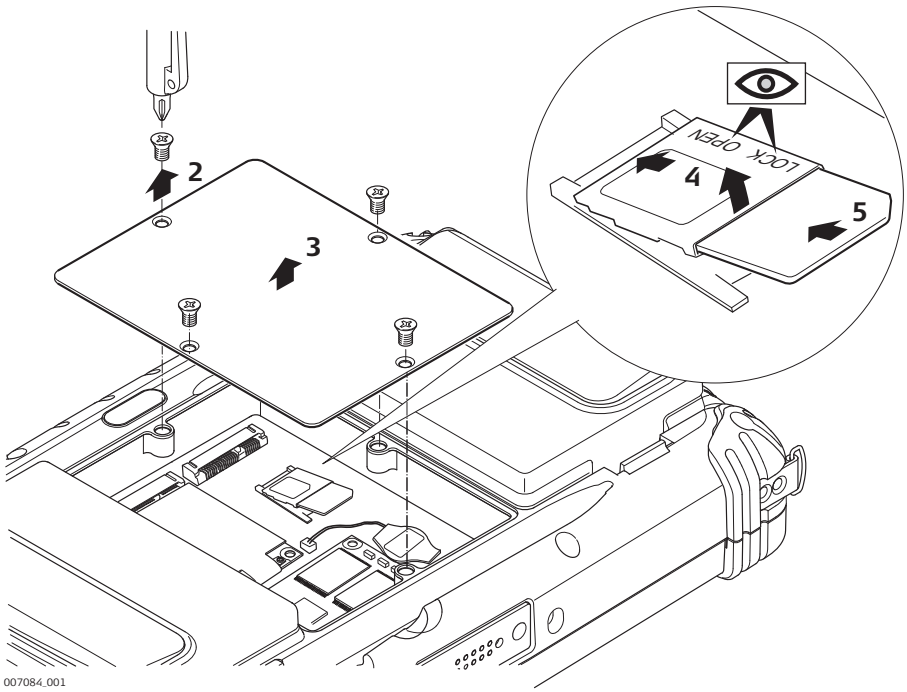
CC61/CC66: Insert and remove the SIM card step-by-step



Step	Description
☞	Ensure the controller is placed on a stable surface, turned off, and the power cable disconnected.
1.	Turn the controller upside-down.
2.	Loosen the screws of the back cover with the screwdriver end of the pen/stylus or a Phillips screwdriver.
3.	Remove the back cover.
4.	Remove the screw from the board.
5.	Carefully remove the connector.
6.	Carefully slide out and lift up the board.
7.	Push the cover of the card slot to the OPEN position, then flip the cover up.
8.	Firmly slide the SIM card into its slot as illustrated. Place the cover of the card slot back into position.
☞	Ensure the cover of the card slot is in the LOCK position again.
9.	Assemble everything again in reverse order.

☞ To remove the SIM card follow the instruction above but carefully slide the SIM card out of its slot.

CC65: Insert and remove the SIM card step-by-step



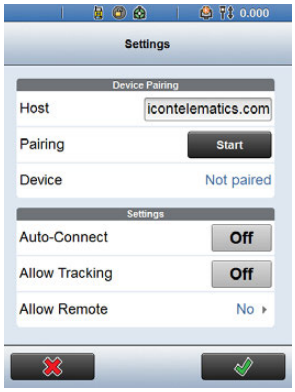
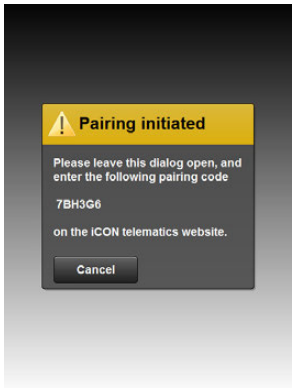
Step	Description
☞	Ensure the controller is placed on a stable surface, turned off, and the power cable disconnected.
1.	Turn the controller upside-down.
2.	Loosen the screws of the back cover with the screwdriver end of the pen/stylus or a Phillips screwdriver.
3.	Remove the back cover.
4.	Push the cover of the card slot to the OPEN position, then flip the cover up.
5.	Firmly slide the SIM card into its slot as illustrated. Place the cover of the card slot back into position.
☞	Ensure the cover of the card slot is in the LOCK position again.
6.	Assemble everything again in reverse order.

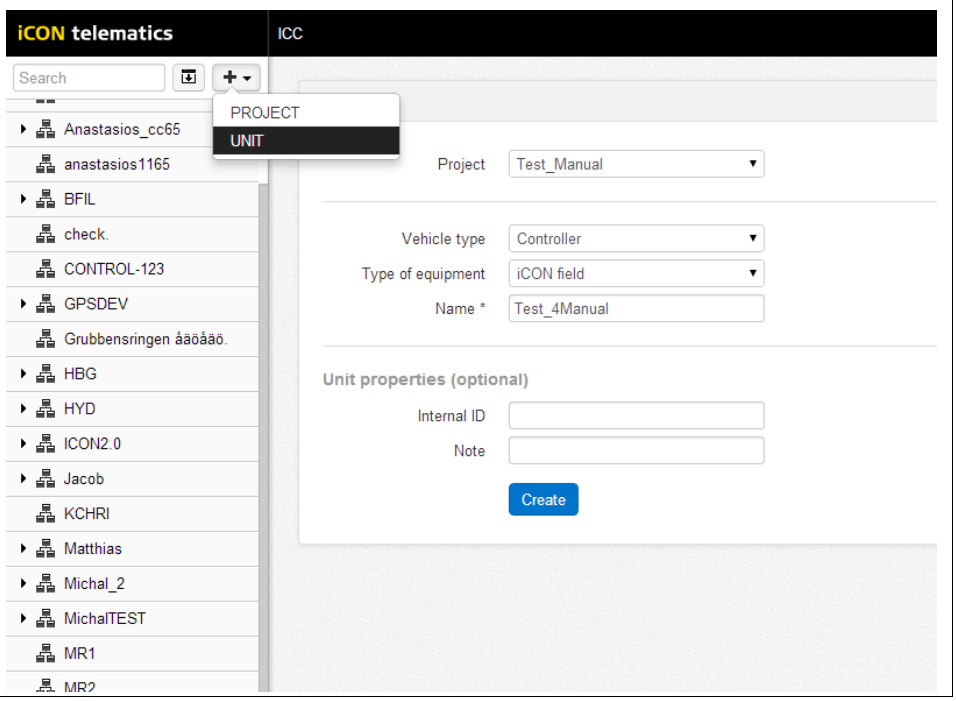
☞ To remove the SIM card follow the instruction above but carefully slide the SIM card out of its slot.

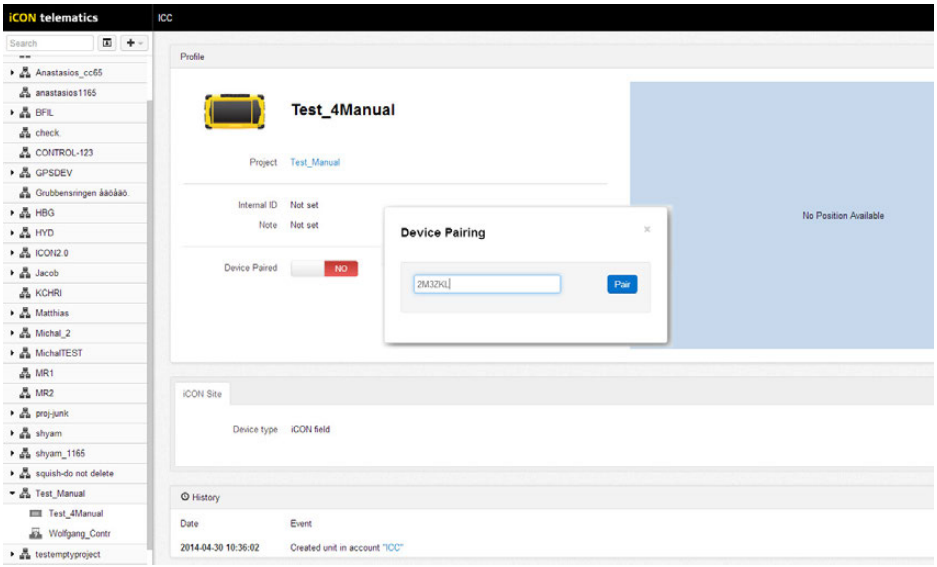
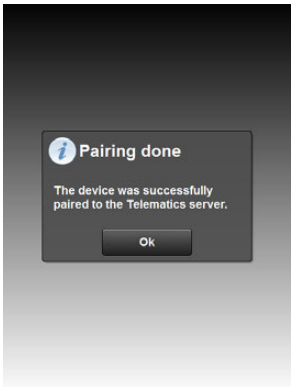
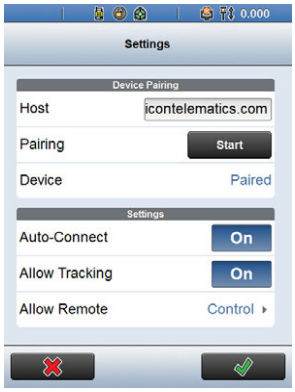
Telematics setup step-by-step

To use the **Telematics** functionality perform following setup works in the given order:

Step	Description
1.	**Establish an Internet connection on the controller:** • using a LAN cable, or • using a wireless local area network connection (WLAN/WiFi), or • using a 3G modem. ☞ The Internet connection on the controller must be set up from Windows, not from iCON site. ☞ WLAN/WiFi connection cannot be used, when a sensor is already connected with WLAN. To establish an Internet connection using a 3G modem on the CC61/CC65/CC66 controller follow these steps: ☞ Refer to "17.2 Installing a SIM Card" for information about SIM card installation. • On the CC61 controller: Go to the Start menu within Windows, and start the **OneClick Internet** application. • On the CC65/CC66 controller: Go to the Start menu within Windows, and start the **AirCard Watcher** application. • In the OneClick Internet or AirCard Watcher application tap **Connect**. ☞ After setting up the connection with OneClick Internet or AirCard Watcher, a restart of the controller might be necessary, depending on the network provider. ☞ Ensure a correct Internet connection, by checking the wireless connections icon in the Windows task bar.
2.	**Start iCON site on the controller.** In case the iCON site software was exited, you can re-enter by selecting **iCON** from the Start menu within Windows. If you logged out after the previous session, login.
3.	**Pair the controller to the iCON telematics web page.** ☞ This is only necessary for the first time the controller is connected to the iCON telematics web page. For the first-time connection continue with 4. to 6., otherwise proceed to 7.

Step	Description
4.	On the controller: • Select **Telematics** from the Home Menu. • Tap **Settings**. Set **Host** to **icontelematics.com**. Tap **Start** to start the pairing process. • An information screen is displayed, showing the pairing code. Be sure to leave this screen open.  

Step	Description
5.	On the remote computer: • Start a web-browser. Google Chrome is recommended for best performance. • Go to the iCON telematics web page: **www.icontelematics.com**. • Use your **User name** and **Password** to login. ☞ To use this functionality an account is needed for the iCON telematics web page. The license is handled on the controller. Ask your agency or your Leica Geosystems representative for information about licensing and how to get an account. • Now create a new **Unit**: – Tap the **+** icon and select **UNIT**. – Select the **Project**, that the Unit should be assigned to. – Set **Vehicle type** to **Controller**, and **Type of equipment** to **iCON field**. – Enter a **Name** for the Unit. – **Different Unit properties** can optionally be entered to easily identify the unit. – Tap **Create** to create a Unit with the current settings. When successful, a confirmation is displayed. 

Step	Description
	• Select the newly created Unit from the list. • To pair the (field) controller and the created (Web) Unit, tap and slide the key at **Device Paired** to **Yes**. • In the appearing **Device Pairing** window enter the pairing code displayed on the controller. • Tap **Pair**. 
6.	On the controller: • The pairing screen should have been replaced by a confirmation that the pairing was successful. The device is now paired/registered on the web page, and ready to connect. • Tap **OK** to confirm the information. • The **Telematics Settings** screen is displayed. Ensure to set **Auto-Connect**, **Allow Tracking**, and **Allow Remote** according to the intended use. ☞ Refer to "Telematics settings" for more information. • Tap ✓ to accept.  

Step	Description
7.	On the controller, **connect to Telematics**: • Tap **Connect/Disconnect**. • Tap **Start**. • After a successful connection, tap to accept.
☞	The device is connected to the iCON telematics web page now and ready for **View**, **Sync** and **Track**.
☞	**Sync**, which provides file transfer to/from the iCON telematics web page, is done using the normal Import and Export functions in iCON site. Once connected to the iCON telematics web page, there will be a **Telematics Server** entry in the list of Sources/Targets.

Connect/Disconnect

Select **Telematics** from the Home Menu.

Tap **Connect/Disconnect**.

To connect the paired controller to the iCON telematics web page, tap **Start**. To disconnect when already connected, tap **Stop**. Tap to accept.

Telematics settings

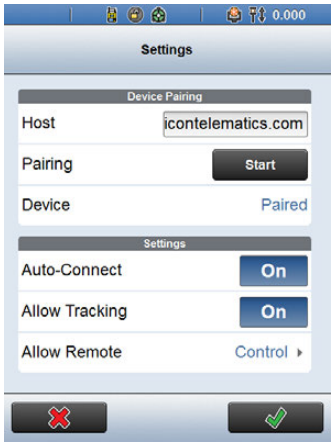
Select **Telematics** from the Home Menu.

Tap **Settings**.

- Set **Auto-Connect** to **On**, to automatically connect the controller to the iCON telematics web page after every startup or login of iCON site.
- To allow to send the position of the paired controller to the iCON telematics web page, set **Allow Tracking** to **On**.
- Set **Allow Remote** to:
  - **View**, to allow a remote user to connect and view the iCON site software on the controller.
  - **Control**, to allow a remote user to connect and control the iCON site software on the controller.
  - **No**, to block any remote user from connecting to the controller.

Tap to accept.

☞ Tap **Telematics Webpage** to automatically open the iCON telematics web page in a web-browser.



☞ If the settings for **Allow Remote** have been changed, **Telematics** will automatically reconnect to the paired computer after tapping

☞ Depending on the settings, different status icons are displayed. Refer to "Status bar: iCON telematics icons" for more information.

☞ Refer to the Help function available on www.icontelematics.com for information about using the different functions on the iCON telematics web page.

18 Check & Adjust

18.1 Overview

Description

Leica Geosystems instruments are manufactured, assembled and adjusted to the best possible quality. Quick temperature changes, shock or stress can cause deviations and decrease the instrument accuracy. It is therefore recommended to check and adjust the instrument from time to time. This check and adjust can be done in the field by running through specific measurement procedures. The procedures are guided and must be followed carefully and precisely as described in the following chapters. Some other instrument errors and mechanical parts can be adjusted mechanically.

Electronic adjustment

The following instrument errors can be checked and adjusted electronically:

l, t	Compensator longitudinal and transversal index errors
i	Vertical index error, related to the standing axis
c	Horizontal collimation error, also called line of sight error
a	Tilting axis error
ATR	ATR zero point error for Hz and V - option

If the compensator and the horizontal corrections are activated in the instrument configuration, every angle measured in the daily work is corrected automatically.

Mechanical adjustment

The following instrument parts can be adjusted mechanically:

- Circular level on instrument and tribrach
- Optical plummet - option on tribrach
- Allen screws on tripod

Precise measurements

To get precise measurements in the daily work, it is important:

- To check and adjust the instrument from time to time.
- To take high precision measurements during the check and adjust procedures.
- To measure targets in two faces. Some of the instrument errors are eliminated by averaging the angles from both faces.

☞

During the manufacturing process, the instrument errors are carefully determined and set to zero. As mentioned above, these errors can change and it is highly recommended to redetermine them in the following situations:

- Before the first use
- Before every high precision survey
- After rough or long transportation
- After long working periods
- After long storage periods
- If the temperature difference between current environment and the temperature at the last calibration is more than 20°C

Summary of errors to be adjusted electronically

Instrument error	Effects Hz	Effects V	Elimination with two face measurement	Automatically corrected with proper adjustment
c - Line of sight error	✓	-	✓	✓
a - Tilting axis error	✓	-	✓	✓
l - Compensator index error	-	✓	✓	✓
t - Compensator index error	✓	-	✓	✓
i - Vertical index error	-	✓	✓	✓
ATR Collimation error	✓	✓	-	✓

18.2 Preparation

Before determining the instrument errors, the instrument has to be levelled using the electronic level.
The tribrach, the tripod and the underground should be stable and secure from vibrations or other disturbances.

The instrument should be protected from direct sunlight to avoid thermal warming.
It is also recommended to avoid strong heat shimmer and air turbulence. The best conditions are early in the morning or with overcast sky.

Before starting to work, the instrument has to become acclimatised to the ambient temperature. Approximately two minutes per °C of temperature difference from storage to working environment, but at least 15 min, should be taken into account.

Even after adjustment of the ATR, the crosshairs may not be positioned exactly on the centre of the prism after an ATR measurement has been completed. This outcome is a normal effect. To speed up the ATR measurement, the telescope is normally not positioned exactly on the centre of the prism. These small deviations/ATR offsets, are calculated individually for each measurement and corrected electronically. This means that the horizontal and vertical angles are corrected twice: first by the determined ATR errors for Hz and V, and then by the individual small deviations of the current aiming.

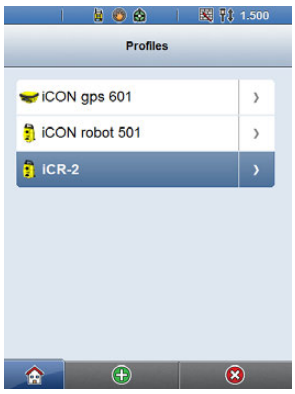
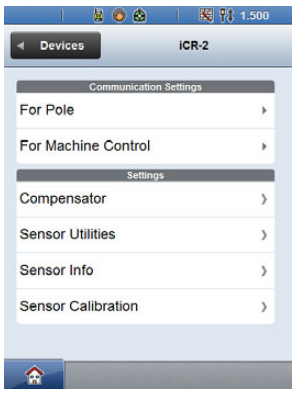
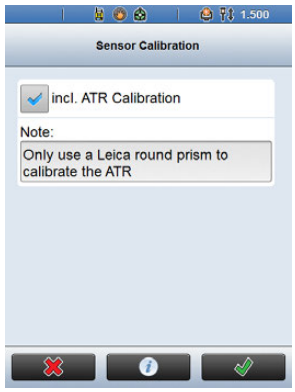
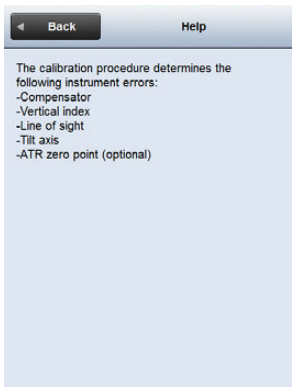
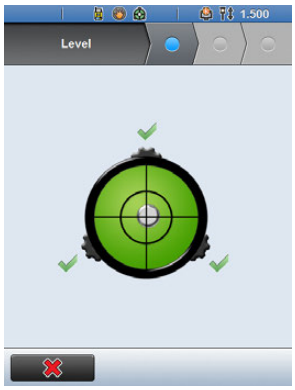
Description

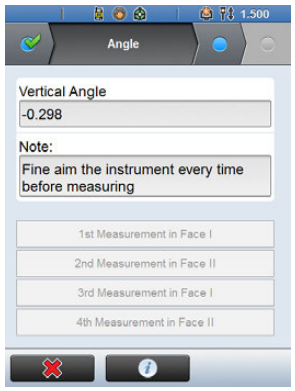
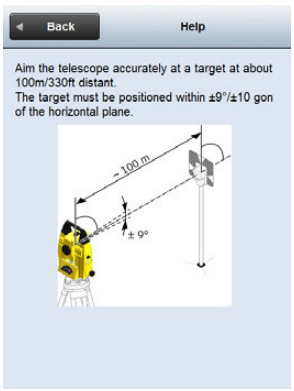
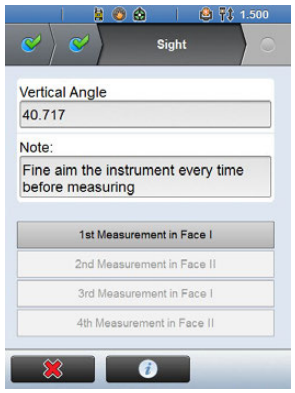
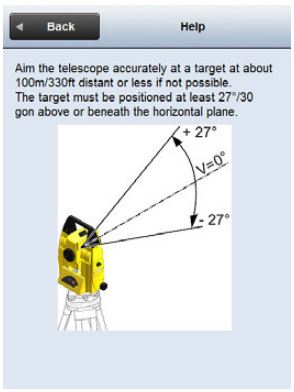
The combined adjustment procedure determines the following instrument errors in one process:

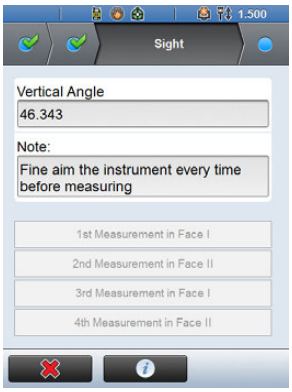
l, t	Compensator longitudinal and transversal index errors
i	Vertical index error, related to the standing axis
c	Horizontal collimation error, also called line of sight error
ATR Hz	ATR zero point error for horizontal angle option
ATR V	ATR zero point error for vertical angle option

Combined adjustment procedure step-by-step

The following description explains the most common settings:

Step	Description
1.	Connect the device with the Instrument. Press **Devices** in the Home Menu. Select your instrument and tap the arrow. Select **Sensor Calibration**.  
☞	It is recommended to use a clean Leica circular prism as target. Do not use a 360° prism.
2.	Select the **incl. ATR Calibration** option if you like to calibrate the ATR. Tap to see which instrument errors are determined. Follow the wizard which guides through the calibration.   

Step	Description
3.	Aim the telescope accurately at a target at about 100 m distant. The target must be positioned within ± 9°/± 10 gon of the horizontal plane. Start the procedure in telescope face one. Press the measurement keys to measure and to continue to the next step. Motorised instruments change automatically to face one.   ☞ The fine pointing has to be performed manually in both faces.
4.	Tap in the wizard to get to the next page. Aim the telescope accurately at a target at about 100 m distant or less if not possible. The target must be positioned at least 27°/30 gon above or beneath the horizontal plane. Press the measurement keys to measure and to continue to the next step. Motorised instruments change automatically to the other face.   ☞ The fine pointing has to be performed manually in both faces.

Step	Description
5.	**Adjustment Accuracy** After pressing the last in the wizard the results are shown and stored to the instrument. 
6.	Tap to get back to the **Devices** page.

19 Software Licence Agreement

Software Licence Agreement

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- when it has to be **right**

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